CA \$3 million shortfall

PROBLEMS with parts production at the Irvine, Culifornio, plant of Computer Automation have been cited by the firm as the main reason for \$3 million shortfall in its planned worldwide sales for the third quarter. ended March 31, of its current fiscal year. CA says that the

ICL dispute over

FOLLOWING II cumpany offer of II meeting on April 11, ICL englacers, members of the Association of Scientific, Teelinicul and Managerial Staff, have decided to end their work to rule which threatened to affect ICL users both in terms of support and the commissioning of new machines. The dispute was over a demand for tolks on the question of engineers being provided company curs.

£100,000 order

AN order worth £100,000 for computer terminal equipment from the North East Thamea Regional Health Authority has been won by Computer Mar-keting. Over 100 terminals are involved and they will be used to access a network of computers handling a variety of administralive functions.

CIS Cobol

A NEW version of CIS Cobol from Miero Focus, introduced by the company, incorporates two new resident utilities and several new Ansi standard commands. Knuwn as Version 3, it has a typical compile speed of 200 program lines per minute on a system using a Z80 micro-

Fortran 77/66

1 MAY

many enhancements

For furthar deteils contact:

HYAC

tion and intarface to HPAC CORAL 66.

CORAL 66 (Version 6)

Perkin-Elmer UK chief to head European operations

EXPANDING its European operations, Perkin-Eimer Data Systems has named Robert Jefferson, formerly general manager of the UK company as managing director of operations in Europe, the Middle East and Africa. This excludes Germany and France where there are already P-E companies.

Jefferson takes over from Nick Bark who resigned earlier in this year (CW, February 22), and his second in command will be Archie Thomas, previously general ision in Europe. As deputy managing director Thomas will continue to handle international operations with responsibility for subsidiaries and the expansion of the distributor natwork.

Another senior appointment is that of Martin Walters, who joina the board. He is haad of P-E's European Software Division.

Jefferson told Computer Weekly that marketing activities in Seandinavia were being stepped up, and a new subsidiary was nearly ready to go into operation in Holland. Thomes



Burroughs first in distributed DBMS

October, Burroughs looks set to same time," become the first manufacturer to have solved one of the key problems of distributed processing, namely the distributed

Details announced by the company last week show that application programs running anywhere in a BNA network will be able to undate remote DMS II databases held on any other configuration in the network.

Only relatively trivial job control changes will be needed to address a remote rather than a local DMS ii database.

Making the announcement, Burroughs' UK communications systems manoger Peter Meleod explained that it was the issue of remote databases above all that had delayed the firm's announcement of a networking

orehiteeture. "A greot deal of the basic software needed for networking was already in place in 1975," he sald, "ond there were factions who wanted to announce a Burroughs networking architecture

"As it is, by waiting till this

NEW RELEASES!

1 MAY —Computer Automation LSI-2, LSI-4(NM4)

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Digital PDP-11, Data Genaral NOVA

1 JUNE —Data General NOVA, Digital PDP-11.

Meleod went on to identify three other significant aspects in which BNA differed from one of the best known other systems,

"The first is that we offer an X25 Interface as standard. In tails of which were first given we con interface not only to packet switched X25 systems but also to SNA itself. All of this is controlled ultimately by Gemeos, which generates the requirad message control sya-

'Another significant dif-

networking software, BNA, now we have become both the first ability to handle non-BNA con-announced for delivery in and the last in this field at the trollers.

'Finally, BNA is not of necesaity a hierarchical network, but readily eaters for networks in which there is no single master host.

Release dates for BNA have also been announced, many de-

fact at the network control level, last year (CW, October 19, 1978). For large-scale Burroughs systems, from the B0800 upwards, BNA software will become nvailable in October this year. Medlum-scale users, together with B1800 users, will get first deliveries around the

More PO strikes

under renewed attack from over 1,000 members of the Society of Civil and Public Servents Association in its Data Processing Service, who voted lest week to take solective strike

week to take solscive atrike scripe sterling tomorrow (Friday) in support of their pay cloim (C.W., February 1979).

Creating e £20 million backleg of unpracessed telephono bills by serilor action, the man are seeking regarding and pay improvements.

The Post Office nerrowly sveited a prolonged strike certior this year by publishing regroding proposels," soid on SCPS spokesmen. "Even without our perity

claim, which the Post Office hos recognised as being justified, Civil Service Pay Research Unit findings would indicate a pay increase of between 20% and 30%."

OEMs first market for Mas-M

DIGITAL Equipment has now made clear that firms engaged in manufacturing and finishedfirat market for the Maa-M applications software it is to market jointly with Hoskyns

(CW, March 29). The move has been mst with cautious enthusiasm by the DEC OEMs most likely to be offected. By stimulating demand, they argue, DEC will open up new

At the same time, they say, the deal wlii giva a new reapectability to commarcial turnkey. systems based on the PDP-I1.

DEC will be seiling Mas-M as the softwara componant of complete computer aystems

Out of service

ITEL in the US la diaposing of about half of its service bureau three UK users had airsady gone operation, accounting for about 5% of its total revsnues, Itel's the software first appeared last data servicea busineas is confined to the US and la separate from its IBM leasing operations and its plug competible processor and peripharal markating

Arlantic Computer Leasing Ltd. 27 Changery Lane London WC2 Tel: 01-405 8238 Teles: 268344

PDP-11/34 or the PDP-11/70 as the central processor

The systems will be marketed only by DEC's manufacturing, diatribution and control division and ara seen by the company as complementing products already marketed directly to end-users by this division.

These are the shop flonr dato collection systems aold by the industrial products group, a subdivision of MDC. DEC saya that It is now working on the problem of interfacing Mas-M to the shop floor system, which also runs on the PDP-11 but under a different operating sys-

tem. RSX. Speaking at the formal announcement of the agreement last week, Geoff Unwin, monaging director of Hoskyns' systems division, notad that live with Mas-M systems since

Thess included Temana. marketing subsidiary of Shall, and the Zockoll group, best known for DynaRod. Another customer had baen Hamilton

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unitation the says involved unitable to realise anything like their originally assigned residual values, and Lloyds could be DECdotasystem-500 series. softwore in purt on the technical These incorporate either the strength of the in-built TP

Hoskyns, he snid, airendy hnd pround 300 users worldwide ni the mainframe MAS system. which consisted of ten mixiules in all. In addition to those identified inst week, these included accounts poyable, bill of materials, material regulre-

ments plunning, and purchasing. Four elements of the system would typically cost nround £i5,000, he said, with the complete set priced at about £35,000.

faced with the biggest claims since the Darwin disaster of 3 few years ago. Mini for teaching

TEACHING undergraduali students is the application for Digico MTS/16E minicomput delivered to the School of Muthamaticol and Physic Sciences of Suasex University The machine is the bigger MTS/16E yet sold by Diglos, at It will support eight teletypes

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Briefing

Ask the wrong

A CRIMINAL record retrieved

question....

Boston bank to handle sell-off of leased 370s

THE big "sell-off" of leased IBM

370s in the US covered by the Lloyds residual value insurance

policies (CW, March 29)

s to be handled by the First

Notional Bank of Boston, which

will use several computer

dealers to try to find new homes

One dealer will be the Boston

The agreement beiween

bank's own subsidiary, Ran-

dolph Leasing of Connecticut

Lloyds and the Boston bank all

not substitute the obligation of a

lessor holding a Lleyds policie

try to find new lessees for his

Insured machines, but It is la-

tended to provide a means of

disposing of a machine if the

Hundreds of 370s covered by

the Lloyds policies will need to

he disposed of this year or o'c

because they are on seven-re-

leases written three or loa

years ngo with early bree-clauses. Most of the lesses it-

volved are likely to invoke the

break clauses so that they the

buy or icase one of the low-cel

Most of the 370s involved at

IRM moinframes.

lessor's attempts fail

for the machines.

GSAFE

THE SAFE MAY to All HOH

computerna

by computer and produced in court has turned out to be for the wrong man, after a manual check at the Criminal Records Office. A defendant at Chelmsford Magistrates' Court was attributed with a previous con-viction that he did not have, because he lind the same name as someone else on the file.

It was finally established that t was not the defendant's record that had been retrieved because he had no tattoo where the other man had one. A police spokesman said, "It wasn't the computer that was at fault, it was presumably asked the wrong ques-

US control is eased

IIIE sale of a Univac 1100 system to the Soviet news agency. Tass, blocked by President Curin hi protest over the trials of desidens (CW, July 20, 1979). has now been given his personal go-ahead following "modifica-tions" to the system. It is not cenain, however, if Univue cun non soft the system as Thes has chead contracted to huy an his-80 from Cll-Honeywell Bull in help it provide coverage for the 1980 Olympic Games.

Government aid

ABOUT \$400,000 has been prolided by the government towards research and development in computer-nided manufacturing of microelectronics, although there is no specific project in this area. This was stated in the Computer by Tas slated in the Communs by Minister of State for Industry Alan Williams, in response to it question from Mrs Renee Short. She then asked why the Advanced Computer Tachnology Project was being disbonded. The Minister replied that support for its work was available through other Dol channels.

13m PO order

THE Post Office has ordered PABX equipment worth over 33 million from GEC elecommunications to be installed in government offices in shout a dozen locations in the UK, including Cardiff, Don-Caster and Norwich

Micros and jobs

A ONE-DAY conference in Southampton on May 1 is to examine the affects of microprocessors on people and imployment it is organised by the Solent productivity Association, and among tha ipeakers scheduled are Albert Booth, Secretary of Stata for Employment and Maicolm Peliu, formar aditor of Cont

Massachusetta. In addition pices of these machines should so trop in the current \$1.800. has year. 193

Pet prize for winning advertisers

Number 648

with NERS of the first Computer Advartissment of the Year competition, which was judged test week at the Computermerket exhibition at the Bloomebury Centre Hatel, were John Ivineon and Yvorne Halldey Irom Altaigo Softwere, seen here showing the winning advertisement promoting the Bhadow II teleprocessing monitor. The advertisement was designed in conjunction with Masey Mukerjas and Russell.

Tag prize of a Pet Commedore remotes

Tap prize of a Pet Commadore computer was presented by Kit Sponcor, general manager of Commodore. In the herdwere cotegory Dets General

received a trophy for their BP Nutrition Good Food Advartisement and in the miscollensous estegory Scicon Consultancy International was swarded a trophy for its

Thursday, April 12, 1979

Trophies were presented to the winners by Berek Nichelson, of British Computer Society Spacialist Group for the Disabled, on behalf of Couchmesd, the organisers. A cheque for £400, the proceeds of the entry feas, was presented to Nichelson, for use by the Specialist Group.

Govt chaos in

ments by the changeover from ICL 1900 computers to a dual 2970 system. The problems have been described in detail in a report by the government director of audit a Hong Kong, a market valued highly by It'll

Turn to page 9

Industry Acl.

department was effectively

worse off for computer facilities

than it had been for several

years, while the Commissioner

for Transport talked about a loss

of about Paliours of work a day

at each of his hence office, due

curred twice a day on average.

Delays of up to four weeks

had arisen in the completion of

The dual 2970 system was ordered more than two years ago, ICI, having won the contract ainst strong competition from Univoc (CW. January 13, 1977), but with the distinct advantage of being the resident supplier. The 3970s were to replace directly a 1904S and a 1907).

One major user, the director of government supplies, said that there was a job failure rate of 10% on the 2970s and that even with successful jobs the average turnround time was Iwice as long as on the 1900s.

Works Department said that the

A spokesman for the Public

Ireland wins race for Mostek factory

THE rnea between the Irish Industriai Development Agency and the Scottish Development Agency to attract the US tek to Europe ended last week, with the news that the Dallas, Texas-based company plana to move initially into a ready built factory in Cherry Orchard, a suburb of Dublin.

This will be the first phase of a three-stage plan to astablish a full manufacturing capability in microelectronics, it will involve the teating of microprocessors and memory components ahipped from the Texas plant. The accord phase will involve a move to e 100,000 square foot factory in Blenchardstown where component assembly will be carried out. The final phase, expected by 1982, will require a second factory dedicated to wa-

fer fabrication, The Irlah agency won the race because it could construct a batter financial peckaga to attract: the company. It is offering development grants of up to 50% on appital spending, tax exemption on export profits until 1980, and from 1981, a until 1980, and from 1981, a maximum 10% tax on profits. The iDA had the authority to picks of the setting directly.

The Scots to some extent lost because they did hot have this flexibility. The 3DA had to work with the Department of Industry on its proposals, and its offer fell

Civil servants aim to hit harder yet to watern breakdowns that oc- THE consument seems no clossification in the House of Commons between Geromt Howells.

former Liheral MP for Cardigun

and Barry Jones, the Under-

In answer to a question from

were for paying agricultural subsidies to Welsh farmers.

Jones replied that "... as long as

the Ministry of Agriculture

computer centre at Guildford

is subject to industrial action.

it is unfortunately not possible

for farmers generally to receive

the grants and subsidies nor-

Secretary for Wales.

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secto resolving its dispute with 500,000 civil servants after the two sides failed to reach agreement at a meeting last week.

statistics, according to the The latest government offer Cummissioner of Census and still stands at a first stage of 9% Howells on whot plans there Statistics, due to frequent sys-(CW, March 22) with the tem crashes and the less efficient remainder phased in by April I, 1980, and as a result, new strike targets have heen selected although details were not available as Computer Weekly went

According to Cumpbell Christic, deputy general secretary of the grants and sub-Servants, on going action will continue to bite hard. through multily because the Doi would not allow Mostek deve-"Our members are absolutely

determined to continue with lopment grants under the 1972 their action," said Christie, This was because Mostek was "even if it goes on for anothar only prepared to commit itaelf to four to five waeka." The National Savinga centre phase one of its plans. As this

at Lytham, which houses Ernie, the Premium Bond computer, Is the bounds of the Industry Act still out of action, as ia the Southend VAT computer cantre, egislation, and was therefore, (CW. March 1). For many farmers tha future

must look bleaker following a

INSIDE THIS WEEK'S CW. ...

VALUE OF CONFERENCES

would not be a manufacturing

operation, it would fall outside

Computerylew - page 2

not eligible for a grant.

Conferences, in general, serve a valuable purpose; but their value is difficult to insecure precisely. Nick Entickrisp discusses the quasilones. How necessary are conferences? and How can we pick the best ones to go to?

VIEWDATA EN MASSE

Viewdata-like systems are under development in the UK and shroad, and plate for mass production are soon to be implemented. Donald Kentett looks at some of them. BILLION BREAKTHROUGH

Robin Weinter interviews Paul Ely, Hewlatt Padand's administrative tens division vice president on the performance, and potential of his company, and its plane to literal through the billion-dellar income barrier this year.

ALSO....

Computerview on the Mostek
idealsion
Focus of deta protection
Texas lifts personal systems
Downtline by Chad
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CW editor killed in

IT is with great regret that we onnounce the death on Sunday, April 8 of Gereth Jones, editor of Computer Weakly, In a motoring accident.

car crash

He was being driven by a send to report on the first heet of Computestive 79, of which Computer Weekly is a coponeor, when the car in which he was travelling was in colli-sion with another car on the road betwaen Gromsgrove and Hingley, Weice. His friend and

the people in the other car received unly miner injuries. Garath Jones, 30, was appointed editor of Computer Wookly after a ancessetul cor-aor as aditor of a number of computer journals published by IPC Science and Technology

Pross.

CH WRITES. "In the short time that Genth James was with Computer Weekly hi geined the support of his sol-lougues and showed n hour



grasp of the assentials af editing n weekly nawapoper.
"Beneath a quiet and likeeble
mennor there was evidence of
detarmination and tenecity —
qualities which would have teken him a long way in the carear which was opening up before him. He will be sorely missed."

Cheers! 1978's been great

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Computer Weekly has a circulation each week of ever \$2.050 including the highest tuty requested circulation in the DK. The International edition, which is published to times a year has a circulation of ever \$4,000. Computer Scaley is sent free of charge to the following ealegaries in the UK and firs only: Englary stern lates, computing service rearragatest Priviter associatives, child servents responsible of as campelling, management/following consultants, lecteres and issociates. By Manager/supervisors, systems as systems as systems of the computer service as systems as systems as systems as systems as system as systems as systems as system as system as systems as system as systems. But systems as sy

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RULES, according to the progmatist, are made to be broken,
and on occasions that should
extend to include government
legislation. Though often an
approximate the state of t agonising choice — whether a rule or law should be broken or rule or law should be broken or not — there are times when lit seems obviously necessary that such on act should be perpetimted.

Such an occasion occurred that Mostek, the Dallas, Texas based semiconductor manufacturer, had finally decided to locate its new European locate its new European manufacturing base in the Irish come later if the start-up was Republic, rather than in Scot- successful. land. The thing that finally tipped the boinnee towards the Irish was the inability frome have said refusal) of the UK's wanting to become a multi-Department of Industry to bend national? In Computerview's the rules of the 1972 Industry Act to ollow the company occess to devolopment gronts.

The reason for this was that und can benefit the whole counthe Act specifically states that grunts cnn only be pold to companies establishing a "manufac- commit itself, totally, to only turing" operation. Though Mos- one stage at o time in its tek has an ambitious, three-phase plon for its European sound business judgment on its operation, it was only prepared part. It certainly does not imply to commit itself to phase one, a any lack of intention to go component testing facility.

Phases two and three, component assembly, followed by

every semiconductor company The obvious question is: why that has set up an overseas manufacturing operation, it will should the DoI bend the rules to be able to start small, train a favour an American company towards a total manufocturing opinion, the answer is that a goal in a planned way. By sterlittle pragmatism, where the rule ting with testing, these new stoft hending actually harms no-one. will not be oble fundamentally to affect the production process. That Mostek is prepared to but will add value to the products, and receive essential

Even though there are over a million unemployed people in this country, by far the most important statistic is the number towards stages two and three at the earliest moment - unless of course it all goes horribly wrong. staff. It is on these jobs that

of unfilled jobs that are left vocant through lack of skilled By following this step-by-step much of the future of the coun-

> British industry depends.
> It seems sad that for the lack of a little bil of rule-hending, the UK has lost a new spawaling ground for the needed skilled staff of the future. To rephrase Neil Armstrong, when he lamled on the moon: "This is a small step for Irish industry today, but it's u glant leap for its industry of the future." Good on the Irish.

try depends. The apportunity presented by Mostek to provide a "real time" training ground could have provided many of

While the new recruits to Mostek will all he starting in the semiconductor business, and many will develop their skills and stuy in the business, some will find other areas of interest relating to the business. They may move into appllcations, software, project minugement. All are arens where there is a desperate need for skilled people. By starting small, it will also add to the kernel of people

industry itself. This is perhaps the major weakness to the UK semiconkemel of new staff with the new ductor industry exposed by the skills they will need, and grow creation of inmos, though not necessarily o danger to the

needed by the semiconductor

those skilled staff.

By going for a complete operation from the start, it can only find staff from the existing UK manufacturers. It seems certain it will find the stoff itself. for semiconductor people tend to be swashbucklers by nature, and like a new challenge. The other companies are bound to suffer, however. They many lose ton people, who will be even

Getting Mostek into the UK would also have extended to contact between microelectronles user and supplier that is essential if new products that are not already obsolescent are to he made. Even politicians admit that it is on these products that the future wellbeing of

Texas Instruments

Edinburgh may replace

THE replacement of VME/B EMAS on the ICL 2000 operate hy Edinburgh Regional Con putting Centre has again become a strong possibility since the Writing in the Istest issue of the ERCC newsletter, Petri

Williams, deputy director of the centre, says: "Since last May, the workhow has risen, particularly through the introduction of a very ber number of 'number-cronching jobs, and the reliability

VME/B has Improved. "The total number of jobs no. nowever, is still small - at Me sent about 300 jobs a day - it it is impossible to forecast whe the machine will be able to provide a mixed batch/interactive service of the type and site originally envisaged and suff required, "A full connection to the

regional network has also to be a**chieved."** Williams goes on to note that

The centre is therefore being forced to reconsider possibility of a change operating system to enable 4 service objectives to be met A change to EMAS is the fore a strong possibility hear

To help existing uses, t period of overlap would be to nired, with a VME/B server continuing until at leasthee!

EMAS, an operating seroriginally developed by fer hurgh for its ICL System started pilot running on the w. versity's 2070 early last 75 (CW, January 26, 1978). Its into full operational serve the 2970 at the beginning! current academic year.

June launch likely for Texas' personal systems

the personal computer market by Texas Instruments now seems set for June, when a puhic announcement la expected. Though the company refuses to comment, there are now atrong conters to as many as four sysems being included in its range, incorporating such features as plug-in firmware packages, and the novelty of built-in apeech

York stock analysta Morgon Sunley, has predicted in his latest newsletter that TI will unveil two systems at the Chicago Consumer Electronics Show in fune. Known as the 99/3 and 99/4, they represent the low-

The company has already

dabbled in the area, with the launch of its own Micro-Box

system at the end of last year.

Based on a single board com-puter in a simple chassis, this served the joint purpose of evaluating the organisational

problems of sdding a manufac-

turing operation to the main

filling a particular market

According to Comart mar-

keting director, John Lamb, this

will be the way the company will enter into full scale manufac-

ming "Il'e are not aiming to

compete with the products of

our suppliers", he said, "we are

rather looking to fill specific

market requirements. There are

the specific products being con-

sidered, primerlly because

manufacturing is not due to

start until the end of this year.

foot factory and office complex

He declared to comment on

plenty of holes to be filled".

stream of the business, while

opportunity seen by the com-

professional market entry of the three systems predicted last year

(CW, Auguat 24, 1978). The type numbers are interesting, becouse they Indicate that the systems may well be using Ti's family of microprocessors as the CPU. If so, they will be among the first 16-bit personal computer systems to hit the market.

The low end model, according Consultant Ben Rosan, of New to Rosen, will cost \$500. With just 4K bytes of RAM, and reculring the use of a TV set as a display, it will be in direct competition with such systems as the Video Brain and Tandy TRS-80. Software will be in ROM, and TI will be supplying

Comart aims to manufacture

programs.

The real novelty with the 90/3 will be the option of a \$90 speech synthesiser, almost certainly based on the chip set used In the company's successful Speak 'n' Spell learning aid. Rosen suggests that it is this

model in the range that has been the subject of approval problems with the Federal Communications Commission in the US (CW, January 11).

The second system, the 99/4 seems set to be a competitor for such computers as the Apple II. The predicted retail price is \$1,000, and it will feature a minimum of ISK bytes of RAM,

There is some speculation in the industry, however, that this system is to be included in Tl's public announcements on the range, and that the system "on hold" at the company's Lubbock, Texas, factory is in fact a WITH o turnover that has grown from nothing to about £2 million in two years of business, built up on member of the range. The UK distributorships for Cromemco, North Star, and Processor Technology microcomputer systems, consectively eyeing market opportunities for entering the business as a manufacturer. fourth and more powerful

illt-in 13-inch colour monitor

display, while a range of

peripheral systems which in-

cludes two types of printer and a minifloppy disc drive will also be

offered. A speech synthesis

capability is also expected to be

ovailoble. Agaln, a rsnge of

plug-in firmware applications

The third system in the range,

a small businesa system known as the 99/7, has been put "on

hold", according to Rosen. With

an expected price between \$3,000 and \$5,000, it was pre-

dicted last year that it would be

capable of handling large data-

programs will be provided.

says Civil Service These arrangements are ex future should be paid for by individual departments nut of their own budgets, instead of from the Centrol Computer Agency's Computera and Telecommunications Vote,

according to a Civil Service Department proposol. This will ensure that departments value the service they ore getting and balance it with other administrative costs, says the

claims for computers, as at pre-

sent, but uguinst the other

claims on the purchusing de-

The CCA will continue to be responsible for the efficient use of computers in government, and will carry out the procurement of equipment either by purchase or hire, but will be paid back by user departments which will have to find the money themselves. This means that the decision to buy a particulor machine will he bolanced not

pected to start operating in April 1980. Parliament will have to vote money for computers to separate departments from then Bureau services within the

government will operate in the same way, with the CCA Computer Centre charging for time used, as will other departments that shore their computers.

According to the proposal, this "will ensure that departments value the service provided properly in relation to alternotive woys of getting the

Level 6 Pascal

AN extended Pascal compiler that runs on Honeywell's Level 6 , minicompoter has been developed by a US software house. California Software Products against other departments lnc. of Santa Ana, California. The compiler operates under MOD 100 or 600 operating systems, on a minimum configurapartment's administrative tion including 128K words of

Whose finger will be on the data protection trigger?

members of the Data Protection Committee been present at a recent IDPM meeting, they might well have wished to preserve some personal privacy. Few present had a kind word for their report.

It was pointed out that in nearly 600 pages of privacy proposals, no mention was made of whose installation finger would be on the data protection trigger. Despite subatantial evidence and statutory zuldelines, not even the section labelled "hypothetical bosic scenario of general requirements" tackled the important area of DP

While much attention is being paid to the protection of data. similar care is not being afforded to the DP teams. With suggested penalties invoking the ultimote deterrent, prison, DP management is naturally apprehensive.

At the meeting the spotlight was well and truly beamed on the DP installation. With the increasing emphasis

Daily Maif

on distributed processing, communication networks and the microcomputer, no DP individual could be expected to be fully informed of all these areaa, lat alone monitor possible infringementa of peraonal

1984 and all that

WHEN the national and provincial Presa write about computers, they often get confused, with results that con be very funny. Sevaral readers sent in cuttings of different variaons of this story; and £5 prizes go to the first two - Molcolm Curry of Keighley and Lawrence Watts of University College, Cardiff. Don't onnoy the computer or it may eack you, Britain's sepreteries have

For 1984 has stready errived in some offices where machines can measure a typist's performance against an employer's terget — and lesue disciplinary warnings if it is not up to scretch. They can even time teabrenkel

White-coller union laeder Mr Roy Granthem esid that this was only one short step eway from latting computers fire psople who did not comply There can be no appeal against the judgement of a machine," he sald, Birmingham Evening Mail

The office statifs union, Apex, says that by the 1980s Britain's offices could be controlled by meetings and run by "mechanical bosses." The union has pledged to flight the literoduction of the eatip, or misro-

ior directors could not be held accountable. The chairman probably could not distinguish

try, seems an obvious necessity.

between WP and DP systems. Accountants, chief or otherwise, would be similarly out of their depth. They are fer more at home grappling with cash flows than data flows. The only data the office manager likes to handle are hollday lists and ex-

pense returns. Meanwhile, the sales manager would probably be more concerned with product dumping than data dumps. Faced with a visit from the DP

Authority, the company will quickly delegate full responsibility to the haad of management services. He in turn will pass the buck to the DP manager who, given the choice of ensuring freedom of personal information or libarty, will lose no time in calling in his senior ana-

All current work projects will then have to be buffered while the DP team pore over IIIdefined, vintage program documentation.

Hugh Pitcher, from the Netlonai Computing Centre, emphasised the importance of good documentation and atandarda Although the proposed codes of practice were flaxible, there could well be a tremendous upheaval in all inatallations with the one notable axception of police file records which are regarded by most as being rea-aonable and beyond legislation. The NCC advice was, "If you

don't need it - don't store it". Only Ted Ciuff from the IDPM believed that the proposals were the bast sat of compromises possible. Most others present et tha meeting had practical reservations about privacy lagisla-tion. Few installations, it was suggested, could access mean-ingful information. Eyen payroli. runa tend to be shrouded in code, mnemonics and aco-

in any case, personal information files are seldom beld on computer systems. They are

more likely to be locked away in Certainly the company sen- a filing cabinet and therefore exempt from the Act. However Colin Smith.

chairman of the branch, produced several practical pointers. including the suggestion of a self-destruct button built intn every application program and the establishment of off-shore data havens.

As a result, it would not be surpriaing if the Post Office eported a aurga of interest in estoblishing direct dota-comm channels between the UK ond Liberia. And the sales of parsnnal filing cabinats should likewise expand.

Ten years

APRIL 10, 1989

PIONEERING NCC director ordon Black resigned to ba-ome Professor of Computation at Menchester University and director of the Regionsi Com-puting Centre at Menchester . . . ICL still led in the Eastern European market, but IBM hed tearly caught up . . . Digital Equipment leunohed its first small computer, the PDP-14... amell computer, the PDP-14.
Potter instrument filed a suit against GDC alleging infringement of disc and tape drive patents. A total of 35 stations were now linked to Boadices, BOAC's reservations system-14 in the UK, 17 in the UB, and three in Europe . In the Commons, Brie Lubbeck said that legislation should control hours of work of young people at pomputer sites, which were not included in the Factories Act:

A final sharing broketage service, instinat, centred on Keydina's University, when the tight in the UB.

the UB

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Comert's merketing director, John Lamb, holds the MicroBox, the company's first venture into menufacturing. With a move to a new factory acheduled for the end of this yesr, Comert now plans to enter the manufacturing orans proper, Like the MicroBox, the products it makes will complement rother their compete with the US systems it sells in the UK. This is when the company will move into a new 10,000 square

in Eston Socon, just outside its honie base of St Neots, Hunist-when they cou be found. Both directors odmit that As a stopgap until the facility locating the right staff is a curo completed, Comart has tamrent problem. porarly had to move into o The software support special-ist will be responsible for develambling, listed building in St Neots, at 12 Huntingdon Street. This has been required become loping a second atring to Comurt's "manufecturing" effort,

of the company's rapid growth, both financially and in headthat of business-oriented softcount. The latter is now starting ware packages. The move into manufacturing to rise sharply. From starting will he carried out without outwith the two founders. side financiol essistance. Accormanaging director David Broad. ding to David Broad, the company's current growth rate of 15% per month provides sufficient resources to fund the Among these naw recruits will inova internally. He is more than pleased with this growth rate.

forth features combined WE major features of the two also be able to run on intal's

igners into one new version, called polyForth.
In addition to the RCA

and John Lamb, Comart now

his will have risen to 35.

CDP1802, 8-blt microprocessor already supported by the micro-forth version, the new-warlant is available for the Texas Instanments 9900, 18-bit micro, as well the ubiquitous Intal 8080. By the end of this year, it will

> COUPLERS. HOORE REED & CO. LTD

miniforth and microForth — also be able to the IBM Series 1. famillea, plus the IBM Series I famillea, plus the IBM Series I and Honeywall Level 6 minicomputers. The new variant offers a faste

dictionary search algorithm, 10-bit arithmetic, a more secure multiprogrammer and a aimple target compiler. The designers Forth Inc of Menhettan Beach Catifornia, claim that this com-piler provides several advanplier provides several advantages over the previous cross-compiler. These include the ability either to execute the compiled code directly for feeting purposes, or output it immediately to any desired media.

The standard polyforth package uses 4K bytes of memory with an accompling and feet editor.

the assembler and text editor.

Having pioneered 1200 bps full-duplex modems in the UK CASE announces a new modem - four times faster than Datel 200 and with additional and a software support special-Wood dock HULL hate "Harefield Read"

Rickmansworth Heris WD3*1PL England COTT recommended BA & Telephone 092 37 76699 Telex 923325 modulation Please send me more details about the CASE dial-up modem LSI design

Optional leased of dial-up working

Company

deals for US customers

with 370s on lease

FACED with the daunting task

of building up a customer base

for the AS/3-5 IaM look-alike

processor, before IaM starts

shipping the low-cost 4341, Itel

has started to offer trade-in

deals to customers in the US

Itel has two distinct IaM or-

iented busineas operations:

leasing IaM's own machines on

that have ISM 370s on lease.

North of where?

regions to ottroct electronics factories. A full-page advert hos appeared in the Wall Street Journal scrcoming, "Come to the North of England!" Ploying on Americons' penchant for nostalgia, It says, "We started the world's first industrial Revolution and we're helping to achieve the second in high technology and sophisticated ngineering." But then it adds, "We spenk

your language."

The numbers game

SOMEONE rang directory inguirles in New York the other day and was told he couldn't be given the number he wanted because the coinputers were out of order. "Can't you lonk it up in the computers are broken."

is the modern oge, sir. We haven't any phone books nuly computers. But the

going to think when he

arrives in Salford and

someone says to him,

"There's now tas queer as

fowk?" Whot on earth will he

imagine chip buttles are?

Probably some new substrate

To cap it all, the advert

showed a picture of the To-

wer of London. I've heard

that the North of England

starts at Watford, but at

Whitechapel? That's a new

fobricating process.



t wants US to prove that there is human intelligence." - - -

QUESTION: Who are Bunzl?

Crime: Time for advice on ethics

correct, then It is time comput-

I speak of crime and terrorism. both on the increase in a world witose moral values are

Computing offers no ultimate solution to either, but it does

Computer specialists alone understand the full potential. Only armed with this understanding can wise decisions be made about the social cost of

where in the country can, on a stopped, for what reason, and so

The UK is not exceptional in this respect; the same service is available to most European and American policemen.

We hove accepted this, in principle a gross intrusion into our privacy, as a necessary compromise in the interest o combating crime.

The more armed robberics. becomes the standard law-andorder argument that he who

commits no crime has nothing to would be transpled on, and the 'Our responsibilities in the

In my view it is reasonable to ossume that the likelihoud of the innocent being pushed about happening due to an orchaic lnw like "loitering with intent."

When the original Great Debate about police databanks was at its height in the late 1960s, there was a comforting argument propounded by computer. "experts" that the hardware cost of full-scale individual sur- no sure answers, no guaranteeveilance was so enormous that, it provided an effective deter-

We have to tell them about the recognition failure rate of The orgument is no longer volceprint, for Instance, ls quite

COGARVIEW

able safeguurds.

puter industry are greater wh risk created of flagrant misuse in the wrong hands of trehniques it comes to the more specia that, arguably, no executive consideration of computer of and technological prevent nower should be tillowed for the sake of its own uncorruptibility.

As computermen it is not our | What wornes memost-se make no apology for religing place to take the moral decisions on this sort of question perhaps; pounded on various Europey that is something the politicians nlatforms before - Is encryate will have to do an our behalf. us the foolproof means of de But it is very much nur place to tell the politicians, and everyone It isn't yet - but it will be a else who is listening, that our technology is fallible. It provides

the 1980s if we are not careful What's wrong with entrytion? In my view its potentie criminal value far outwelghal value in preventing crime.

Why did - and apparen duos - so much Synditue money go to back civil liberted campaigns against wire tapped in the US? Simply because win tapping is society's currend most effective weapon age organised crime.

With effective encryption, a one can send messages to 1 one without any third par heing sinle to crack them with a useful period.

Two groups of people at ought to be able to access cri will be locked out by effense encryption: law enforcement agencies and suditors.

Companies, and anyone & perating an encrypted system will be able to deny knowing of any part or all of that sive: entirely selectively.

OK, we can apply same of the going on, but if the conceit. I the data is more impute than, say, n finite prisoner the data will remain co. with people pleading to usi resort where disclosure become mandatory.

the first place, though. At least with the iBM pro-Lloyd was adsmant that prosuls now odopted by the Nutional aureau of Standar. per development of the economy would lead to more jobs rather there remained, in the opinion than fewer, but we had to permany muthematicians, & G. suade people to be more ready to siderable probability that change, and we had also to cryption stayed within these reform the tax system to reward vince of, say a security secur innovation. It would toke ot least two parliaments to establish these new attltudes, lie

cruncher. They just weren't quite !! secure, some believe delib intely. But the latest devely ments in encryption at MITE misc a public-key technic which will exclude even the

The evidence in the USB in individual and corporate (00 puter crime now totals at less \$300 million o year. The avery haul from compuler-rell bank embezzlements, forts stance, is calculated to \$500,000 - or 25 timer at 25 as a typical non-computer Auditors are worded that the

are increasingly taking their for finagling about which the which they had insul

which they had insure powers to unearth.

Discussions have now his started on giving such present the could negate all the could negate all the could negate all the computer criminals ac tolerant computer criminals. In the first place it a worse that soo many intelligent motivated white collar work who would not dream of who would not dream of wing a house see pothing as gling a house see nothing

Turn to page 13

IBM hasadded to Italina of point of sale equipmant with a proper retail outlets. Called the 3680, it can communicate with a 370, The 3680 is a disketta based iound on biggar PoS aystems price look-up.

The heart of the 3680 system is the 3684, a combination of teresting and control unit that in diskette storage.

The 3884 can operate either in withdrawais.

On-Line Systems operates a line-up ot Digital Equipment DECsystem 10s in Pitts-United Telecommunications is one of the hurg, while Atkins On-Line at Epsoin has sister companies soon, some bureau's US biggest common carriers in the US aside from the communications is one of the acquisition of the Epsom bureau's US biggest common carriers in the US aside from the communications. acquisition of the apsolution of the acquisition of the aside from the communications giant, AT&T, and chalked up profits of \$160 million on a \$1.43 billion turnover last vees one DECsystem 10, which it acquired after it was taken over by OLS in 1977, and two

billion turnover last year.
UCS contributed \$76 million of this total OLS revenues in its fiscal year ended January 31 came to nearly \$28 million, onethird of which was contributed by Atkins

> OLS and United Telecommunications signed an agreement in principle on March 30 under which United would Issue 1.26 shares of its common stock for each OLS share. A total of 1,835,000 United shares worth \$34.7 inillion would be issued. The deal is subject to OLS shareholders'

of Atkins On-Line, Dr Dennis Chandler, supercomputer. Time on the Cray I machine of Ations of their rescommented that the services of t Even chance Tories will back micro policy

isation's internal information

processing was the key to its

success. IaM's was much better

than the UK government's, he

suggested, and Houda was bet-

ter than British Leyland at ana- the election.

that the Conservative Front with Arthur D. Little and author of the working group's report. Beach would accept the policy thought that people's inability to change was often exaggerated. on information technology proposed by lan Lloyd's working group, seconding to the former MP (CW, April 5). Lloyd went on In 1940 because of the war, he pointed out, 85% of the people to say that although up to now political racognition of the between 18 and 60 had retrained successfully. We hod to create a dramatic changes in human affclimate in which people wanted airs that microelectronics will to change, he said, whereas at bring about, had been mesgre. present it paid them to resist it. more and more MPs were now

United Computing Systems will probably be other.

United Computing Systems will probably be sister companies soon, following the

munications.
United Telecommunications aiready owns

whose European arm is officed Computing

OLS will operate as a subsidiary of UCS.

becoming conscious of the pro-

Lloydalso expressed the view

Scots agent

for Harris

HARRIS Semiconductor hee

appointed Phoenix Electronice is its representative in Scot-lend, Phoenix, which was founded in 1972, will market the July range of Herris Semiconductor

Semiconductor products and provide a design advisory ser-vice. The company will be

exhibiting the Herris range et the All Electronics/Seminex

Exhibition, which is to take plees in Edinburgh from May

um Building, Vere Boad, Kirk-mirhill, Lanarkehita.

it was totally wrong, Norman went on, to make organisations which needed to change pay a penalty in the form of redun dancy money. That slowed down change, and society was

centre in London.

ots will operate as a substituty of the bull is expected to retain o high degree of autonomy. The president of UCI in London, autonomy. The president of uci in London, autonomy. The president of UCI in London, while the hardware line-up in Kansas City includes two CDC 6400s, three 6600s, one Cyber 174, twin Cyber 175s and a Cray 1

LUCS runs two CDC 6500s In London.



Norman: inability to change exag

the loser. Since society benefited from change, it should carry empinyees over from one job to

The institutions set up after the wor, Norman sald, were oppropriate for the 1930s, not the 80s and 90s. He cited union structures and town and county plnnning systems, adding, "We have an extraordinary capacity to stop things happening." Wor-ker participation, he said, would only slow up decision making.

There was enormous potential for the British economy in tha further eatabilshment of the City oa an information procassing centra for the world in many fields of commerca, especially since most international communication was carried on in English, There was also a very large markat for micro-based consumer products in OECI

Lloyd expressed tha view that

BM adds a programmable ^{PoS} system for small retailers

Atkins On-Line in link-up with LUCS Itel AS/3-5 trade-in RXOS Sigma 9 machines.

United resecondulated areas of Kansas City.
United Computing Systems of Kansas City.
United Computing Systems of Kansas City.
Whose European arm is United Computing whose European arm is United Computing whose European arm is United Computing which covers most parts of the latest contributed \$76 million of this total from operations like its Uninet network which covers most parts of the latest contributed \$76 million of this total from operations like its Uninet network which covers most parts of the latest contributed \$76 million of this total from operations like its Uninet network which covers most parts of the latest contributed \$76 million of this total from operations like its Uninet network which covers most parts of the latest contributed \$76 million of this total from operations like its Uninet network whose European arm is United Computing whose European Western Europe and embraces the LUCS

Although Lloyd's group is in

favour of continued government

support for the micro, there is

still considerable doubt about

the likely effect of a Tory win in

a third party basis, and morketing the lam compotible Advonced System series. Last month Itel let a customer in North Carolina out of a seven-year lease on a 13g after just one year, and exchanged the 13g for a twn Megabyte AS/ The customer was Salem Car-

pet Mills of Winston-Salem, and itel delivered the AS/3-5 to the firm just one duy after they signed the contract. A source at the curpet company said: "They must have had n truck circling our huilding." Itel's main selling point for the

Advanced System series in

general and for the AS/3-5 In porticular is very rapid delivery rather thou lower cost. The AS 3-5 more than matches the 4341 In power but it costs twice as much to buy as the IaM

To get round this problem, itel is offering the AS/3-5 on an 18or 24-month lease at charges that work out less than renting a 370/148, thus making the AS/3-5 s more attractive alternative to the 14g for a user who needs more power and cannot wait for

Short leases written on AS/3-5s now will terminate around the time that IBM storts shipping 4341s in volume, but Itel hopes that it will not lose many users because it will offer to renew the leases at reduced charges. The AS/3-5 also offers significant advontages over the 4341, including an eight Megabyte maximum muln memory capacity and MVS support that is not available from IBM with the 4341.

There is now a permanent address for temporary staff.

Hiring extra staff on a contract basis is a very good way of coping with those extraordinary peaks in the workload which happen to most companies now and again.

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already includes many national and multinational companies, wa have a standard to maintain. And our new Contract Staff Division is going to

The Division is headed up by David Garnsey. What he doesn't know about contract work isn't worth knowing.

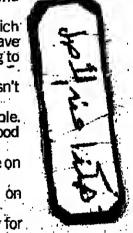
We believe in giving our contract staff the best deal possible.

They get all the fringe benefits and security expected of a good

The result is that they are committed - to us, and while they're on your premises, to you.

Next time you need overload help, call David Garnsey on

When your problem's disappeared, we'll still be here - ready for



John Goldsmith Computable intestinalism Contraction



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QUESTION: You may remember us — Bunzl Data Systems

ANSWER 2: Wa have become one of the largest DEC OEM's in

our own people for making it happen.

- The first OEM VAX 11/780 order

and production control system.

Our time-sharing PDP II Bureau is probably the

We want to thank our clients, our suppliars and

A large number of 11/34 or 11/70 installations

- Seles of Impoon the new DEC-based inventory

- Wida penetration with Finar - the financial

On-going conversions of ICL and IBM Users to

- Severel major organisations as clients of our

was launched in late 1977.

ANSWER 1: What has happened since then?

biggest in the UK.

Our successes include:

modelling package.

ermen stopped hiding behind the hardware and came forward to give an increasingly bewildered innocent being pushed about public some sort of guidance idue to computerised surthrough the ethical jungles that veillance is less than the same

evidently changing.

provide a set of powerful detective and preventive tools - if we have the nerve to use them.

exploiting this potential.

Today in the UK, a policeman cruising in a patrol car anywhilm. Ifft his intercom receiver, relay a licence number to his headquarters and within 25 seconds or so be told the owner's name, whan the vehicle was last

nuggings and bank helsts we read about, the more convincing

true. Hardware costs are fast! high once you start increasing unsophisticated. At the same 25-30 people. time the socio-political press-

ures have begun to change. civil liberty lobby's argument on based on a sort of balance bet- criminal activity. ween privacy and crime preven-

threatened the indiscriminate man in the street has to take on blowing up of aircraft in mid- trust.

But once the first aircraft is nilowing us to fly.

explosives, set on automatic through the hand boggage is on pliot and aimed at the White intrusion, the volue of which has House, be stopped in time? I not been conclusively demonthink not. It took security staff strated,

pletely unauthorised. Could any computerised sya-tem keap tabs on the disgruntled blown up? military? Or how could someone In bit by bit, and then, having set That is too arrogant a claim,

city to ranaom? of volceprint recognition tach - that we saek. niquea to identify phone convaraations and aimliar antitarrorist weapons ndt so far being used (or not admittedly, anyway) ara no guarantaa

anyway) ara no guarantaa against the crime. Thay are a putative step in the right direction; they might nat a few terroriats—but in time? And at what oost?

uman rights of many people.

becoming insignificant, and the the number of known identities software involved is relatively. beyond o tightly-knit group of

Computer specialists

alone understand

the full potential...

They have to deckle witether a predictable number of ghastly Opinion is hordening against crrors (with innucents thrown criminals and terrorists, and tha into jail, deported and the like is part of the price we must pay for principle seems to be bowing to legitimote use of the technique more pragmatic approach in onti-terrorist and anti-

Once the politicians have decided, they can safely be left to i om scared, though, that ter- put the right kind of publicrorism is going to become the interest gioss on the practices major threat to civil liberty in they odopt. That is why we, the the 1980s. The terrorists are get-ting technologically smarter. specialists, must beware of allowing outsize claims to be So for they have only made for technology that the

light, but I do not doubt thut, Current airport security hey have, or arg close to having, mensures are a case in point. the means to carry out the There is a strong feeling in the US now that the right to snoop For a finite period of time the periodically at what we are carthreat is acariar thou the rying around with us is the

blown up, others are bound to Security searches muy pick up follow and in no time the bosia of a few nuts, OK; but any reasonunrestricted air travel could bel ably intelligent person who wants to gat o gun or explosives But there are many potential aboard an aircraft con still do so. errorist actions which are too in current US thinking; the horrible to contemplate. equipping of dinky little uirports.

Could an aircraft, filled with with innumerable guards going

five minutes last year, to discover that a helicopter landed in the price-tag we attach to freetha White House grounds, com- dom. Are our personal liberties, as we know them today, worth

Nota that I avoid saying be barred from renting a room in "having a few hundred people a tall building, filling it with blown up in an incident that conventional explosives carried could have been prevanted."

up a talephone-actuated trigger . The thorny problem lies in machaniam, holding a whole establishing a system or systems that constitute a definite threat In general terms, the problem to personal liberty, but which la that mass surveillance, the usa only may provide the protection That's the general question.

DIGITAL MICROSYSTEMS DSC-2

DIGITAL MICROSYSTEMS DSC-2

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Putting old forms and codes on new screens

SOON there will be more display screen terminals than civilised people on sarth, in the rush to move the hardwhre in quickly, we are all too often tempted to convert the current system design by moving the familiar computer data Input form, and the codes that helong to it, on to the screen.

There can be some very good reasona for doing so. The keving to the terminal may be hased on that form, and the people in the organisation may be very familiar with that form and the codes. The intent and the solution are both good, except for a few details.

Displny terminals are not; equivalent hardware to the noper form. They cannot directly replace it. Forms designed to be used by human beings may function very poorly when used by a compil ter. Just to mention one critical difference: On a poper form, the human can coally occess, changa or fill out any port of it 'at random". The typical display terminal tends to restrict this randomness. Light pens and touch-sensitive screens are not yet the norm. The paper form ussumes unndoin access ability on the part of those who fill it out or modify it. The typical screen display terminal and associated pro-

grams tend to force sequential skipping from field to field.
There is another set of Important differences between the paper form and the display terminal. The paper itself is unable to sense what hos been filled out on it, to evaluate the content or to relate the content to files. The terminal, as we are all nware, often has or can have these posabllities at the same time as each field is being given to the screen form.

It seema a ahame to have developed auch a powerful tool as the present computer, only to disregard its possibilities and bow to the traditional limitations of a paper form.

If, for example, you input 36

OCT, the computer will be

programmed to guesa that this

is a date (for obvious reasons)

and to fill out 78-10-30 in the

field for date. If there are

aeveral date fields it will try to

decide in context of other In

puts which one is intended. If

in doubt it will be programmed

to ask for help. If 28.69 la input,

the program might work on

the assumption that the

out 00028 69 on a form, and

might confirm that the amount

was reasonable, by limit

checks, by pattern checks or

by reference to the files. Maybe

the amount was one of eigh

current price categories for

product 23456, and the price ia

nctually used as an identifier to

select the size and design of a

shirt. The computer might at

this point even fill out the cor-

rect product colour, size or

far more design, programming and analysis. It will also

require more hardware

resources to support. But In

high volume applications (and

why else would we put it on a

computer?) or in high

relinbility applications (that is

another possible reason) the

benefits of being able to work

directly and in native humar

codes will outweigh the costs

and make this sort of thing a

ough to explain in detail, con-

vince the scentical or lilustrate

that this applies to your case

too But I hope a few of you

wera stimulated to avoid raw

copying of the old form on to

It was atili VSAM'a job, how-

ever, to turn device-independent

I/O requests into I/O commands

This short column is not en-

good investment.

Naturally all this will require

design on the screen.

ount was keyed. It might fill

There is a compromise. have been surprised to see how rarely it is used in the multltude of designa where it clearly would have been a

The basic dealgn is to ollow input data elementa to be entered independently of the content, sequence and format of the form. The data elements should come in in their natural sequence, their natural format and their natural context of related data elements. The computer program should be responsible for deciding which data element is Intended, how to convert the input field to the conventional display format as found on the form, and where to place the converted standardised format data on the standard form. The whole subject of han-

dling natural codes in natural sequences tends to disturb most professional programmers and designers who have been brainwashed by conventional data processing input design traditions. They tend to assume it can't be done, and enn list 100 reasons why It won't work in their particular case. If you feel this way, it is natural, and if you want to know how to handle natural data, the kind humons preferred before the punched card days, you can learn about it, in fact you could teach yourself by programming what people practice in order to fill out the forms! But a detailed text on the aubject will be found in Humaniscd Input (Winthrop-Prentice-Hall 1977).

SOFTWARE FILE-1

Identical specs for Pascal is aim of **British Standards**

AN early milestone in the standardisation of Pascal has the BSI and ISO standard should be the same, so that to the publication of the first draft by the British Standards Institu-

Document No. 79/60528 DC. It Is avuilable from the BSI General Office, 101 Pantonville Road. London, N1 and is priced at £1.50 to BS1 members, £2.00 to others. Those applying hy post are asked to include a self-addressed

In line with its normal practice, the BSI has set a two-month period for comment on the draft stnndard. The end of Mny is thus the closing date for the receipt of comments, including those from the ISO countries to which the a longer period in which loc standard has also been circu-

renction is critical to theplan publish a raylsed document the end of the year on which vote can be invited.

The document is also significant in being the basis in work by the newly formed has committee, X319, tasked will devising a US standard for

The BSI document is under stood to be the base dra necepted by X319 and could be come an Ansi standard within relatively short timescale, To would then allow the commit sider the more difficult quest. of language extensions.

Ten years on for George 3

ICL's George 3 operating system name, integration, and refer is 10 years old this month. Its first release appeared on April 1. 1969. An onnivarsury celebra- this for supporting the pool; tion has been orranged for those who have been clusely ossocioted with the product for the evening of Friday, April 27. It is restricted to those who

manuals, or anybody respon who has had close links with tdevelonment team. Further details are available

tirm — the production of us

Trum Roy Walker, who he arranged the event on Bracke. have at uny time been involved 26024, or from Mick Bally with the development of the (Reading 472803) or Briss E. system - including mainte- tun (Wokingham 79002).

Ships' library expanded PREVIOUSLY restricted in mation per ship is now 185

ships exceeding 4,000 gross tons, the ship chorocteristies library maintained by Mardata has been expanded to include all ships over 1,000 grass tons. Data Ineluding 76 fixed Items of infor-

sume 31,000 vessels work. Mardnta is jointly ow." Linyd's Register of Ship Lloyd's of London Press! Marine Management Synt:

Ine, of Slamford, Connects.

66 QUITE SIMPLY PIX GIVES YOU AN SDLC NETWORK ...QUITE SIMPLY 99 IBM 360/370 users. Establish SDLC network easily, quickly without the SNA front-end hardware or software required by IBM the simple answer the only answer PIX REMOTE COMPUTING FACILITY For details call Steve Goodwin on 01-8901477 Ext 35 or send adverts name and company letterhead to Data Communications Division EMI rechnology, St. Labs (EMI) Ltd Spur Boad, Feltham, Middlesex.

SOFTWARE FILE—2

THE decision facing ISM big-system users is now an imager whether to convert to MVS, but whise.

This was the recurring message from speehors at last wesh's Onlies conference dedicated system; is the conference of the conference

guirantes. Statele, it was sigued. The fuectional sed performesce edvanteges of MVS

The fuectional set performed a covariages of MVS were also sited as helpleg to ovorcome user resistance.

But perhaps of most algelficance, the time could assily be seen when ISM would offer just three majerage operating systems: MVS, DOS/VS, sed

vi. "BVS support is to be dropped from the end of this

year, and the future of 08/V81 looks uncertale," said the coeference chairmen, Alan Liebert of Camputer Management Services. "Although the 4300 issuech was accompanied by a

new releaso of VS1, few of the 4300 devices are supported sed there is an evident growth path for V81

supported sed there is an evident growth pain for VS1 users. The 303X mechless streety support VB1 nateby isse thoroughly than they do MVS."

This thoroughly than they do MVS."

This thoroughly than they do MVS."

This thoroughly than they do MVS."

Itel intermational. Discissing the advertised title of this presentation. "The rationals for a move to MVS."

"There is eo redonsie: you have no choice. It's nat s questice of why, but whee."

He west os to remind delegatos that the seed for s

esad to utiliso recources optimali-

"The SCP is the tast you have to get work does, gives a cartain slopesd time ead's CPU sed other css. Ite etm is to make use of every passible bit, trach, and momary cycla that the configuration hee

PETER HEWITT REPORTS ON ONLINE'S MVS CONFERENCE

A critical factor here, he said, wen the number of

multiprogramning levels supported.

"VS1 streedy applies to a very limited hardware group. On a smaller 148 and belaw, you would rue 008/VS, while on a terger 188 and obove, only MVS has the skillty to drive the CPU at full utilization.

"VS1 then only applies to a large 14B or a small 158. And it ise't very appealing because of its low multiprogramming level in regard to large mach physical size in regard to small machiese." nieg levsi in regard to lerge machinee sed lie

aome respects radically dif-

ferent from its predecessors.

the conference brought to light

a number of interesting fea-

tures which could surprise the

the absence of poging.

or other file is converted with.

out change to VSAM, the first

buffer is used for VSAM itself.

This can lead to a significant

"Super 003" — In the form of Rolsase 35 and 38 was, he epid, just round the corner, implying that sither OOS/VS as a cut-down farm of MVS could fill the gep

If VS1 were to be scrapped.
"There would thee bo oee SCP for the lower range of meshinos - 008/VS - eed ona SCP for the upper

ranga — MVS. Title epproach makes eeeso end beare the beeuty of simplicity."

VM, he ested, could not be considered a gamera purpose SCP as na "moselegful" batch work could be

Although not ell the speehers were coevinesd the VS1 was disappearing, the romarhably high etten-dence at the conference suggests that a great many OS sites are in agreement with the general thesis and eaw sen o futuro canvarelos to MVS es lesviteble.

Security, stability impress users

HIGHER security, greater atability, a clear growth path, and mora extensive control facilities - all cited by IBM as advantages of MVS - are beginning to weigh heavily in its

ayour in the eyes of users too. And it is clear that the need to support multiprocesaor configurations together with growing TSO workloads have been Important additional factors in overcoming user reslatance to 18M's glant operating system.

Steady Improvements in MVS

— first released in 1974 ond now almost certainly attracting the pulk of IBM development effort have alao helped.

"Uatil MVS 3.7 was announced," explained Jlm Manderson of the Post Office data processing service, "we considered that the expected cost of MVS in terms of extra hardware and suspected reduced performance in our environment outwelghed he claimed advantages.

"With this release and the new SRM it was felt that the balunce may have been tipped."

On Investigation, the PO found that with 96 TSO users, a batch job stream, and 5 Megabytes for MVS:

a) MVS TSO throughput was 10 per cent worse than SVS; b) MVS batch throughput was about the same; e) MVS TSO response was 17

per cent worse than SVS; MVS used 3 per cent less CPU than SVS.

"With these results, and confidence that MVS could be improved with further tuning, it was considered that the benefits of MVS did outwelgh the costs and a conversion was author-Ised, VSPC and MVS/SE were seen as Important attroctions in reaching this decision."

Although the PO runs MVS on n uniprocessor 168, the fact that only MVS and VM support multiprocessor configurations was n significant factor in the case of onother user, the Royal Insurance Groun.

Megabyte 158, we were suffering from about one unacheduled IPI a day due to both hardware and softwore failures. This had no small impact on our TP opera-

The advantages of a muttiprocessor configuration led the Royal to combine two 158s into a 3 Megabyte MP running under MVS, with a considerable improvement in reliability.

"We now make just one, scheduled, IPL o week. Though this in port due to the greater reliability of the 3033 on which we now run, our post implementation review while still on the 158s showed consideroble savings.
"These included a saving of

100 machine hours/year for quicker scheduled IPLs, and 400 man hours/year because of no partition redefinition. These were directly attributable to

"We also benefited from a throughput Improvement of around to per cent.

Studies auggest that the beat general guideline is to increase the number of buffers to 10 under MVS. IMS performs worse on a multiprocessor under MVS

than on a uniprocessor, instal-

 From 1.2 mitllseconds on a lations are therefore tending to 158 under MFT, CPU time per run IMS and CICS opplications I/O rose to about 4.2 on o separate MVS machine. Illiseconds under MVS. On o Most commonly encoun-168, EXCP time rose equttered program conversion valently to 1.5 milliseconds. Alt measurements were made in If a double-buffered ISAM

ornblem is in moving records from 1/O areas to work areas. Where voriable length records are involved and the maximum length is currently moved an exception will be generated under MVS because of its different buffer nllocation. In

Surprises for the unwary decrease in performance. general, if you cheated before and got away with it, you will be caught under MVS.

● If a medlum-loaded non AVS system is converted to MVS, it will generally use more CPU but will get more work done. A heavily loaded VS1 system will often not get so much work done under MVS.

 MVS poses n number o problems for operators used to older OS system. For exemple most operators believe that doubling the number of initiators will double the throughput. This is emphatically not the case with MVS, where swopping will in this case reduce performance consider-

Changes on the way in the packaging and delivery of MVS StGNIFtCANT changes appear formut, though this option has

imminent in the way in which MVS is both packaged and de-

With Release 3.8, the system will no longer be available in distribution library format, lustead being supplied in discrete functional modules. It is also likely to be available in the tPO

not yet been officially announced for 3.8.

IBM is also understood to have restructured its program product extensions to MVS. These will not now cut across functional boundaries, as for exomple the RACF SU did. touching all MVS functions.

operating systems, notably ments are likely to the future to he coocentrated in chargeable extensions. One of the first manifestations of this is expec- ted to be Release 2 or MVS/SE. which could contain a massive enhancement of MV5 function

Way to device independence

ONE interesting aspect of IBM's 4300 series in the company's return - ofter more than 10 yaara - to the use of non-

removable discs.

Described by IBM as combining high performance with low cost, these are the 3310 disc drives - available on the 4331 only — and the 3370, available on both new processors. DASDs incorporating non-

similar drives using removable disc packs. In this, the new degeneral robustness of the 4300 aerlas - which does not need air be conditioning and can be types with the minimum of trominidlacs, but with complate
davice independence. Non-removable discs could

also be seen as a way of selling niore hardware, aa thare is no alternative to buying a naw drive when diac apace runa out. One aspect of the new disc that has led to much speculation

is why they should use radically changed method of data recording, namely Fixed Block Mode (FBM). From the standpoint of the CPU, FBM does away with the usual addressing scheme of cylinder and track. It replaces it with what ICL has been using

number. Although IBM may have other and more cunning reasona up its sleave, it has been noted that, FBM can thus be seen as a bard-ware, extension to VSAM

for years, a simple relative block

PROGRAMMER NOTES

itself faat becoming IBM'a standard file accass method. When VSAM was introduced

removable disca are of course to auperaade ISAM, cylinders likely to be more reallent than and tracks were turned into the much more flexible concepts of was that VSAM files could then

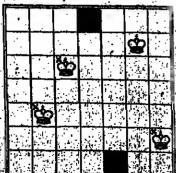
involving cylinders and tracks. VSAM and thus the CPU, wns atili very much concerned with sed on diac.

precisely how files were organ-FBM has now done away with this, opening the road to backend processing.

The central processor now no longer needs to know the physical datails of file layout and there is speculation that virtual "control areas" and "control in- disca might now be creeted vices are closely in line with the tervals". One advantage of this which have no physical coun-

davice Independance.

methematiciana have tended to negiect all "grids" other than the 8 x 8, since the chessboard is



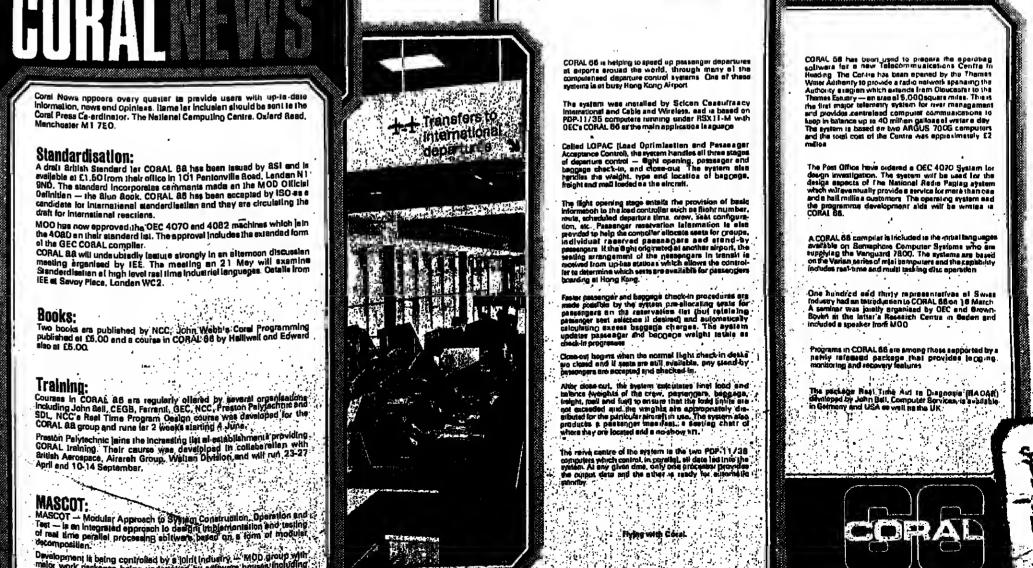
Puzzler

IN past years, recreational where most game theory anahere is a problem to adjust the balance a little, involving a 7 x 7

board with four chess Queens placed on it. The task is to move the three Queens marked X to new positions, so that all 49 squares are elther occupied, or attacked in a straight line by at least one of the pleces. (At the moment, the Two shaded squares are unattacked). The unbracked Queen must remain on its original source and all three "moves" square, and all threa "moves" thus be legal straight-in-chess moves made hor zontally vertically to the same and the same

See page 37 for solution.

Development is being controlled by a loint industry. "MOD group with major work packages being undertaker by software houses including CAP, Software Sciences Umited and Systems Designers Ltd. SOC. s.few CORAL compiler for IAM 370 mathines being to MASCOT Proglain-mind to Core.

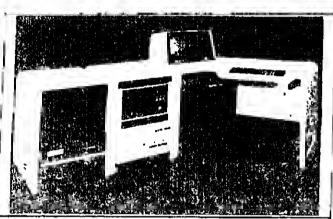


BIS directors appointed

where he has led the development o the company's management services. Terry D'Connell, monoger of development division, Is executive director of the board, as is Gerry Richings who is monager of the Manchester office.

BIS Applied Systems has appointed David Dryar and Derak Petts as associate directurs. Potts has been munager of the company's training division since 1977, and Dryer has worked in the consultancy division

angelo, who is returning to his native Liz Aitewell has joined SMR Sales and Markeling Recruiters to set up a new company, SMR Technical Sup-



KEYPACT. A Key to Disk system with RJE & batch processing.

Simple, but powerful KEYPACT offers easa in formatting, validation, verification and rolormatting. Without disturbing the data entry operation, concurrent programs can be run to support the tocal processing. Up to 31 keystalions, local or ramole, are supported by a 16-bit computer (up to 256K bylas). Disk memory ranges from 8.8MB to 400MB.

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DS 377. IBM Replacement VDU.

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★ Ediling ★ Bilnking

* Delivery ex-etock

DS 1920. Teletype replacement VDU. * Formai 1920 cheracters ★ 79 to 9600 Baud

- * 15" Screen
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- IBM Compatible controllers/printers

* DS 376 Contrelle: with 16 * 180 c.p.a. priniara





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Walkerden to head **British Olivetti**

selection and appointments manager for Control Data Inatitute. The educational services division of ced of Kelih Walkerden as managing director of British Oliverti, one of the largesi aubsidiaries in the Olivetti group. Walkerden is currently managing director of Oliverti Australia, and has been with the com-Barry Foster has joined Digico's sctenufic and industrial sales team aa a salesman for tha East Midlands. He pany for the past 18 years. He will be replaced by Ika Honigstok, who until now hos been northern division was formerly a salesman with IBM, having started his career ss a field engineer with Burroughs. Previously manager, with responsibility for Queenstand and the Northern Terganeral preduction manager for Digico, Frank Gibbs hos become Throughout his coreer with the company Walkerden has held both field service engineer for the com-

port People. She was formerly UK

sales and managerial positions, and in his new rote will replace N. Col-Jerry Thompsoo, who is chairman and founder of Shade Computer Services, has been appointed an in sentotive of the newly formed BCPL user group committee The committee was formed earlier this month of Cambridge university

> Mike Taylor has become European technical aupport special ial with Digi-Daia, with responsibility for sales, support and cus-tomer training. He was formerly ant engineering manager.

at the group's inaugural meeting.

Bob Lamble, ofter working as serditioning for the past three years, has been appointed to the board by Vrigin Air Conditioning (Scotland)

Pnul Keane has been elected to the newly-creoted position of executive vice-president of Penril. He was previously vice president and prior to



THE Impact of the microprocessor revolution was explained at a graduata conference given by Pleasey Telecommunications. Some 170 new graduate troinese attended the conference, where they haord managing director Dae Pitcher stress the importance of

the development of young talant in o period of "asciting devalop-ments" in the talesommunicodons industry. Our picture shows some of the greduete rocruits leeking of en alectronic unit during o tour of Pleasey's Basaton

Liveware Saga by Don



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AND THE PROPERTY OF THE PROPER		VA O	
	21	1/2 770	

Activities including a aponeerod radio show by students at the University of Kont at Centorbury have relasd money towards computer equipment for a blind student. Sis student disc jockays were spon-sored to work 12 hours each as part of a maration

72-hour racorded programma. Other events included suctions and compatitions. Been here is Keiren Even presenting o choque for the amount roles to Profesor G. Mortin, deputy vice-chanceller of the salver sity and chairman of the computer sommittee.

By Judith Morris

Ed Coopar has been oppointed field salea manager of Livingston Peter Atkins has joined Arbat (UK) as project leader. He was pre-Hire. This promotion comes six viously senior cumputer auditor at months after Cooper Joined the company as a salasman. Previously a salea office managsr, Mike Collins Nall Chalmers hus joined Computer Machinery Company as territory manager for Tyneside, Teesside and has been appointed salea manager o lumberside. He was previously a

Andras Casplar haa become Gaelie applications manager for the US aubsidiary of Compeda. He joins the company from Monolithic Memoriea where ho was mask design manager. and in his new position will be based

John Couch has become vice resident, software, for Apple Comducts monager. In his new position he will have responsibility for nil systems and applications of software

April of their small computer up piles package. He was formen s vice-president of nperations. Before joining the enmpany he was vice-president of manufacturing for muchines for Moore Paragon Soul

salesman with NCR,

APRIL 18
Specialised OBMS techniques T
O'llian, BCS Specialist group, University
College, London WC1. Micros in action, BCS and Amateur Computing Club, NCC, Manchester,

Chorles Johnson has Joined Prlam

Which word processor, and seminar, inbitech, Regent Centre Hotel, London APRIL 19

Trade union perspectives fan Denson BCS Loudou branch, Waldnri Hotel, Loucuni systems, on appraisal of cut-levelopments. BCS, Stoke Hotel,

Gulldford. 19.30. The new Information media 1018 South Esses branch, West Cilif Hotel, Westellff-on-yea, 19.45,

Seven a slide succer and disea. DUS Belfast, Uprichard Park, Belfast, Dotalls from W and F Beron, left Belfast 59415. Euronet, P. Kelly, ACS data com-munication specialist group, BCS leval-parters, 13 Mansfield Street, Landon Wi

What next in the affice? Not. Pate?

BCS Rumpshire branch, Vish to Esso, Fawley, 18.00. Planning for the 1981 census, BCS Local

Cover movement group, West Midir's Country Council, I Lancaster Circ. Illerninghout, 1-1 on Please note, see trery on 01-828 2333 if you wish to and

thas heen financial contribut where it has been financial controller of the CAD Centre. His place has been taken by Ted Mellish who has one to the centre from the Dol head.

Ketther New has become product

re he is to head the launch in

APRU, 21-26 HIM CHA annual forum by fit Hotel, Bournemouth 1400. APRII, 25

HUS Sussex branch Visit to be Calculonian Airways, Galwick A; Landun, 1130 otolum, 1130 Interactive computing, Study Gra-computers to Survey Analysis Vast a Podytechnic, Mauchester.

Mile improvessor man to conseque! It is North Statfordship branch Pri Layer, Playton Ludge Rolel, Newco under-Lyue, 2000. Data protection legislation BCS la briegh branch. Heriot-Wall univers.

APRIL 28
I'on puter rided drafting and its
blowling office of the 1980's Died
compating techniques section 1 Bining
With, London SW1, 14 30.
Lecture and demonstration, BCS Red Wiles brough, PYE TMC Midneshin

The significance of computing B South West branch, Wonlord Hopel Burrack Road, Exeter, 19,00. Distallution visit, In JW Windows BC Distallution visit, In JW Windows BC What host in the directive with the property of the property o

Jects. RCS Medical IScot

Special travel arrangements to visit the Compec Europe Exhibition

(Brussels) IPC Electificel-Electre nic Press been reaerved at the Shert Hotel, Roglar Placa * Ltd., the world's lergest publishers deperiurs transfats * admissor of computer, alectrical end etronie journals, hava mad speciel arrengements for reedars wishing to visit the Compac Europa Exhibition. Tha cost includes traval by schedulad

Tour A May 8-May 11 1979 (6 nights) et the Sheroton Hotel from C206.00 (7)

Reader's complaint inspires package

ICL is taking advantage of a Philips user's disconnent to develop standard software for the motor parts business. The user, SMG Motor Factors of Stourbridge, Worcs, desperately needs a bigger system to handle its stock control operation and ICL has offered to supply SMG with a complete system for 20,000, charging nothing for the software.

pluined to Computer Weekly

earlier thia year that the infor-

Data Systems was not nearly powerful enough to handle the

volume of stock updating in-vulved in its business (CW,

Philips offered to part ex-

change the Informer for a much

more powerful disc-based P410

sysiem, but Philips costed the 410 system at £36,000—about £20,000 for the hardware plus

An SMG spokesman told

Blow to

women's

equality

THE potential impact of tha

troduction of the microprocessor "could seriously out book

mada towards aquality of

opportunity." This was the claim of an official of the clarical

North Waat arae secratary Pater Scott, tolking at a joint BCS and NCC discussion on tha

nicro ravolution, said that

woman's equality would take n step book baceuse the major ompleyers of famola labour, bunking, insurance out illa-

tribution, would be "obsolutely days stated by the introduction

the microprocesser."

He told an audiance of 200

that society would have to changa to cope with the situa-

DON'T forget to send for your

entrance tieket to Compee

Europe, the nnnual computer

peripheruls exhibition to be held

the largest show in the series.

Brussels from May 8-10, and

Tiekets nre avalloble from

Roum 821, Illffe Promolinns,

Durset House, Stamford Street,

London SEI 9LU, tel 01-201 8437.

THE two Control Data 7600a at

Manchester University have

now been linked, forming what

Is claimed to be the first multi-

moinframe 7600 production sys-

tem in the world. The special

software required has been de-

University link-up

Compec Europe

tickets

nion APEX.

£16,000 for the software.

mer VRC sold to It by Philips

W. German authorities flout data

DESPITE West Germany's Date Protection Act, and similar Acis In several separate states, many national and local government authorilles are atill selling name and address lists on a large scale, according to the Federal data protection commissioner, Hans Peter Bull.

Sometimes these sales comply with the Act, but often they do not, according to Buil. Apparently local authorities in nicular do a brisk business in selling detaila of marriages, births, school-leavers and the like to moiling list firms, banks. and similar agencies. The driver and vehicle licensing centre in Flensburg apparently earns between £500,000 and £750,000 a year selling registration dota.

One sale that Bull lins censured wos the passing ul' a newsletter mailing list from the Economic Cooperation Ministry to the Protestant Church In llavaria, which wanted to send out a questionnoire. The list contilned information un Church and trade union affilintion, and so its sale was in fact a

breach of the Act. The Act forbids the passing un of a name and address willinut the subject's permission, but according to Frank Koch, a Bavarian lawyer, many linnks and insurance companies include a provision in the small print of their contracts which constitutes this perintssion being given. Thua, he suys, the Act "is tronsformed Into n use.

less scrap of paper".
The Directory and Direct Adertising Association operates on a voluntary basis, what is called the "Robinson Crusoe List" on which people can ask to be put if they wont tu be taken off advertisers' malling files.

Scanners for China

A CONTRACT for the first general-purpose CAT scanners to be sold to China has bean signed by EMI. The equipment, destined for the Cancer Institute of Pehing, conslats of two whole body acannara, a 7020 and a 7070 dy acannara, a 7020 and computing ataff, and Control computing ata a 7070, and an Emipian 7000 Dota. The link allows flias adlation therapy treatment

Civil servants' dispute Tha aliagation that there were

From front page mally paid through that compu-

A more recant victim of the Excise cargo section at Heathrow Airport, which has been subject to partist strike action
The Customs and Excise people were having troubla with the Lacea online import ciea rance system at Heathrow due against the future use of other reight being held up there." said who said that it was working that it was working who said that it was working that was a said that it was working who said

freight being held up there," said a spokesman for the Civil and a spokesman for the Civil and Public Servants Association. There was an attempt to gat exira disc cepacity, but we pulled out about 90 di our members already working to rule."

members, the linion is with the towards an agreement with the towards and agreement with the towards and the towa

problems with the Laces system was denied by a Customs and Excisa spokeaman, however, Scalotion is the Customs and who said that it was working who

members, the union is working.



be installed in three or four Two young visitors inspect a Honaywell Level 6 minisomputer at the Phllips told CW that II would Glasgow. At the Honeywell stand, those looking for o job could onter their qualifications into the computer, which then displayed appropriate job descriptions and vaconcies of Honeywell's feeterioe in Nawhouse and help SMG find a buyer for the informer and guaranteed to Uddingston. Some 48,600 visiters oftended the exhibition which was officially opened by the Minister for Stote of the Scottleh Office, Greger

Indian govt order goes to CDC THE centrel mainfraine for In- mini-based terminols serving all It Is understood that in

matics centre is to be a Control Indian Government (CW.

writing all the applications soft-

ware for us and plans to offer it

to other motor factors aa a

package. The ICL machines will

provide the informer's new own-

er with full hardware and soft-

wore support.

Funded by the United Nations Finalists for the \$2.7 million development programme, the contract, which carries much NIC is to be . hierarchical net- prestige, were CDC, and Burwork of minicomputers and roughs with a B7800.

dia's ambitious national infor- the major departments of the henchmark tests Burroughs. using the enriler B7700, outperformed CDC, but that a final price reduction by the latter. compled with delays in production of the B7800, Ilpped the scales in favour of the Cyber 172.

From front page

running of systems under entulation.

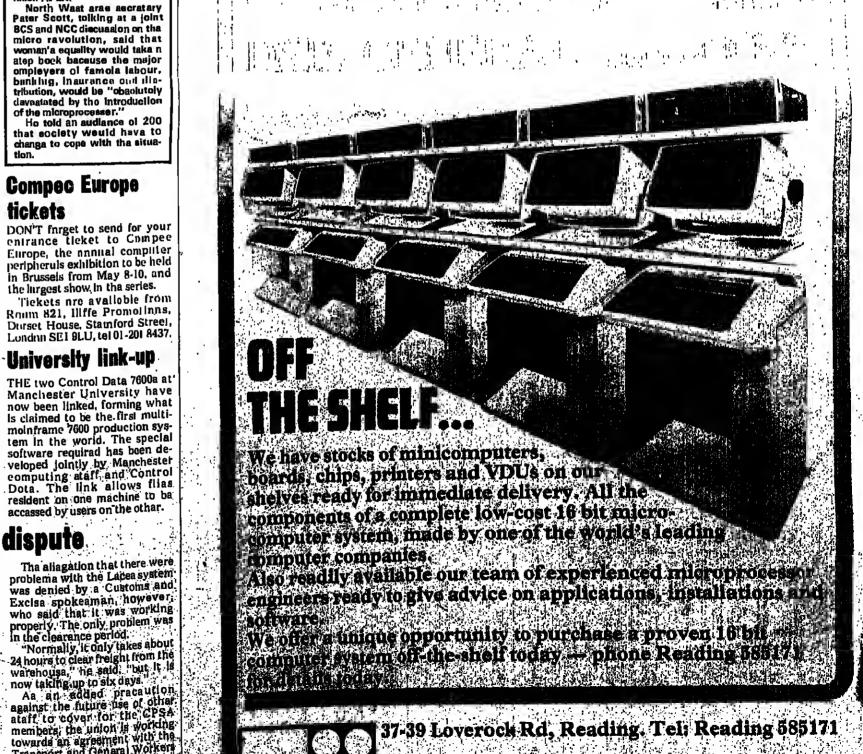
Some of the original 1900 systems ere still running under emulation on the 2970s although most have now been converted to run under VME/B alung with new systems.

Replying to the criticisms in the directur of audit's report, the director of administration and management services pointed report was based took place during the most troublesome period of changeaver in July

August läst year. He admitted Iliat getting the 2970 system to operate satisfactorily had been more difficult than expected and that the difficulties would have been more easily resolved if the 1900s had been kept as back-up after June inst year when the changeover was made. But this would have eost \$500,000 in mintal.

He revealed that ICL had supplied 750K bytes of additiona memory for the 297tts at no extra charge as part of its efforts to

-



GIJISO SERVICE IS OUR HALLMARK

MICRO NEWS

New bubble market Wide range of systems with Bell technique to rent

alysts remain sceptical about the rosy future that has been forescen for bubble memories, the news that Bell Laboratories could be producing a single, I Mbit device (CW, March 29) within a year highlights the potential of this new technology

The development team, led by the co-inventor of the technology, Andrew Bobeck, has found a way round some of the design child have restricted his development. The memories Bell plins will be a third the size of ihose currently available, and have a dula rate that is ten timos

Bobeck announced the developinent at a conference on magnetic bubbles in Palm Springs, California.

His teem, Stuort Blank, Duane Butherus, Frank Clak and Walter Strauss, see the development mnrket for replacing existing inagnetic media, and into the telecommunications area, Bell Labs is already using bubble memories in some telecommunications applications, not- of the market. ably the 13A Announcement

System. Here they are used to play back the "call-assist"

The key to the increase in data ted many of the enthuelastic rate and the reduction in device predictions about the bubble size is the development of a new method of moving the magnetic the device. Current techniques require that the garnet moterial used to hold the bubbles is centred between a pair of coils. These generate a rotating mag-netic field to move the bubbles.

Bell's new approach is to replace the coils with thin layers of either gald or aluminium. These layers have oval holes etched into them, and when a current is applied to them a magnetic field is created.

A major advantage of thie new devalopment is that the manufacturing process required is now compatible with semiconductor techniques, which could mean they will be cheaper to manufacture.

Disregarding for the moment extending the potential of the the new applications for bubble bubble memory beyond the memories, such as the telecommunications areas being ex ploited and exomined currently by Bell, this latest development could well change the views of some sceptics about the future

Venture Development Corp. a

vestment company in Wallesley. Mass, has for example discounmemory market, and has put a limit of 230 million dollars a year on its predictions for 1981 factory ahipments of the device.

The basis of these predictions was the expense of using the devices as replacements for moving head disc memories, the resulting conclusion being that the major market would be in competition with fixed head systems only. Bell apparently feels that such

market estimates were aminently justifiable, before this new approach to bubble memory manufacture was deve loped. However, the possiblity of much lower unit costa that the development heralds could change this view.



Future developments will include the ovallability of North Star Horizon and Vector MZ sysome through the hiro company. The new operation is to be monoged by Mike Maughon, seen

here with an Apple II and on Exidy urchseed Nascom 1.

By Martin Banks

Help and advice from users' club surgeries

"Then stop using the light

No? Maybe not, but it is the sort of corn that immediately

springs to mind with the announcement of what basically seems to be a good idea. Micus, the new microcomputer liser club formed by the Institute of Data Processing

Management, has decided to hold monthly surgerles for existing and potential users, at which three or four apecialista will be on hand to give help and

The first is planned for April .26, and will be hald at 6g Oxford

"DOCTOR, doctor, my computer's got spots before the eyes."

and 6 pm. The second, in June, will be a surgery dedicated to advice and help for users of the Commodore Pet. Later in the summer, the club plans to hold a telephone aurgery, a phone-in for people who cannot get to

> The May aurgery is being missed to make way for the an-nual meating of the IDPM. Scheduled for May 23, the AGM wili incorporate a conference on the subject of Micro Manage-

To be held at the Bloomabury Cantre Hotel In London, it i expected to explore such topics as the impact of micros in traditional data processing, and some ideas of the office of the

Abacua is haid in the CBiOS

section of the oparating aystem

- 512 bytes of user-definable

disc map is written into the sys-

tam memory and utilised in the

same way as the original map.

Changes in diec size can there-

fore be accommodated while the

system a running.
According to Rowe, the cost

of the modified CP/M will be

about haif as much again as the

When required, the aacond

Mixed-disc easier to use with CP/M change

A RELATIVELY aimple modifi- addition of a second disc map callon to the popular CP/M table. The standard CP/M has stem for microcom- one such table, which mana both nuters has been written by the logical and physical aectors of just one aize of floppy disc. The accord table added by Abacus Computers, and allows the use of two different sizes of floppy disc drive in one aystem configuration. According to Abacus managing director Derek Rowe, this overcomes one of the few weak spota in an otherwise excellent operating systam.

The ndvantage of the modification, Rowe saya, la that mixed disc operations can now be employed with total transparency to the user. He feels this should be of particular interest to potential OEM systems bull-

The basis of the change is the

Two new models from AMi

GREATER integration of the address up to 64K bytea of systems functions on board the memory. Each incorporates' systems functions on poard the chip are provided on the new clock circuitry, thus sliminating clock circuitry, thus sliminating the new form AMI Microsystems, Both chips are object code compatible with the \$6800 and can 128 bytes of RAM

EVEN though microcomputors have drasticolly raduced the coot of obtaining computing power, they can still represent a const-derable investment for many purchssers, end the prospect of buyers making expensive mis-tokes in their choice of microcomputer system has attracted another company to stort up o rental service for small systems. This tatest company is

Vicrodigital, the Liverpool-base computer store, and its rental operation, Microdigital Hire. pisns to have evolible o wide range of systems to choose from. Thess will include the Commo-dore Pet, Nescom 1, Exidy Sor-cerer, Tandy TRS-80 and the Apple II. Prices for hiring these systems will renge from £2 s day for a Nascom 1 to £10 e day for on Apple Il with 48K bytes of

A full renge of peripheral systems are olso planned to be available, os will a software library ourrantly being doveloped.

Microdigitat la about to se nounce a now "high-level" tonguege designed to ran et i atendard Nescom 1. Called Mt. of mamory. It will coul fill a buy, and will be given free with t

Improve its working relationship with BASF storage media —the original A BORING WASTE OF TIME, OR A WAY TO GET LATEST IDEAS?

What do you get out of a week at a conference? By Nicholas Enticknap

pots of the big city? A refreshing break from the daily grind? A stimulating opportunity to gain perspective on the latest ideas? Or a boring waste of time spent listening to self-opinionated nonentitles who like hearing the sound of their own voices?

These are the sort of views you are likely to hear whenever the subject of conferences crops up. In general, they do serve a valuable function; at least, that is the verdict of many of our readers who tell us how they appreciate Computer Weekly's tegular coverage of upcoming events (see below).

BASE 1

BASTON BOY A. W

Disk Comments

We wouldn't axpact you to give your

computer en Easter egg, but thera'a

Data modules

The trouble is that there are low to buy a small business better sense of proportion about too many, all of their covering subjects of compelling interest.

The trouble is that there are sometimes to buy a small puellness better sense of proportion at the installation's problems.

And the stimulus of merestimate are system. But justification is the installation's problems. But the value to be derived from For those involved in high them is virtually impossible to

ei v. i v. i v. i v. ii v. ii v. ii v.

A.M. in the sould ..

BASE 626

Disk Rate

From BASF.

something you can buy it to make sure it You benefit from both aldee of the coin

meintains quality performance whatevar with BASF madia. Firstly; as a worldwide

the eeason. And that eomathing is BASF company in the chamical field, we are

Storaga Media. BASF has achieved axparts in the development of well-

I would like to recaive information on the following BASF storage media products.

They provide information, they give n perspective on a particular area of development. but they don't give you a nice quentifiable aaving which can be duly gift-wrapped and pre-

measure.

In some cases, obviously, the value can be taken for granted. If you are just about to acquire a small business eystem, il makes

level strategic planning, it's part of the job to keep abreast of the so. But if your responsibility relates more to day-to-day corporate activity, two or three days away from the office is much more difficult to manage.

Apart from the question of

Signification of the computer large

acquiring needed information, there are other benefits to be gained from going to n conference. Simply geiting out of And the stimulus of meeting

new people and considering Issues which are not among your everyday concerna does freshen latest developments, and con-ferences are a good way of doing thusiasm. This line of argument is

exactly the same as the one most people would adopt to justify their annual holiday(s). Bul clearly the DPM cannot go off on holiday every week; equally clearly, he cunnot go to every conference which might interest

So how do you decide which sense to go to a conference on the office conthelp you get a ones are really worth going to?

computars require. Each BASF product

benefits from these advantages, in mora.

than 100 countries, BASF etorage media

are proving thair wonh by wall-balanced

quality: Renowned computer manufac-

BASF products into thair systam.

BASF United Kingdom Umitad, EDP Division, Haddon Hsuse,

Tel. 01-637 8971

BASF

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Conferences are eimos an industry on their own as witnessed by the en tries at the foot of this page. Nicholaa Entic knap, himseif a requiar "victim," tekes a lighthearted swips at the conference ecene. He urges that they should be better planned end documen-

authoritative speakers, leading manufncturers, specially lailnred for, of great interest and benefit to, all of which tell you nothing. And the wording in general borders on the

Conferences can easily de-For most people, the answer is . generate into mere chat-shows if gut reaction. But on the off-chance that there might be a out and properly structured. The they are not carefully thought more scientific answer, we con- subject should be clearly detacted one or twn conference fined, and the various aspects to companies to see what they be tackled by the different speakers should be precisely de-

To put it briefly, they didn't.
The established conference The spenkers, too, are worth considering. It is ead but true that some people more or less make a living out of the conference circuit, skilfully disguising the sume talk to cover a whole variety of different topics. Such people are usually entertaining speakers, but their under discussion varies from remote to non-existent.

not much use for making decisions about future events. Nor does it tell you much about why people go to con- detail in their CV. If they have ferences - most of them savit's any experience worth menbecause they want information. Howing you can be sure the prowhich is not very liluminating.

Funnily enough, these responses tend to be rather uncritical about the subject matter; delegates usually reserve their venom for description of the venue and the catering, gone into the conference. which suggests that the acquisinuly phiectives

That conference organisers have difficulty in providing convincing reasons why people should go to their extravaganzas is shown up conspicuously in their publicity.

The word "conference" itself Is virtually taboo — you are much more likely to read about a seminar, a forum, or, if they are really trying to impress, a sym-

The text is then sprinkled with puff-type expressions such as days spent out of the office.

companies, such as infotech and Online, follow the practice of issuing questionnairas to delegates nt the end of each con-This does give them some kind of ideas about how well they have done, which sneakers were good, and that kind of thing. But it's historical information, and

> These charlatans are betrayed in publicity material by a lack of mutors won't he trying to hide it

question of documentation. This is always a good indication of the quality of planning that has

If proceedings, which include tion of information was not the a write-up of what each speake is going to say, are to be ready in sers must start working several menths in advance.

Good documentation also give the delegate a chance to concentrate on what the speakers are saying, rather thun having to take notes. And it gives him something to show to his own manager when he gets back. It's always n good ractical move to have something positive to show for those few

CONFERENCES

THE INSTITUTION OF ELECTRICAL ENGINEERS le organiang a major confarence ae a part of Communications 80, for the exchange of information and views on the latest trends and developments in communications it is in highlight the user sepects of communicatione equipment and systems. It will take piece at the Matropole Hotel, at the NEC, Birmingham, from April 15-18. Dataits from the Conference Osportment, IEE, Savoy Piece, London WC2

OSL.

THE National Agricultural Centre near Kanliworth le tha venue for the second Numerical Control Equipment exhibition and confarance fram April 22-24. On show will be tha latest developments in the automatic control of machina took for re-equipping the manufacturing industry. NC'79 is the second rescialised event concorning the applications of numerical contral and epimputer, sided manufacturing, it is sponsored by UK Committon magazine, and Numoridea. Details from Corinthirn Exhibitious, 290 Brighton Road, South Croydon. Tet 01-681 7055.

A WORKSHOP to increase awareness of how resourcee can be planned ond controlled is to be run by 818 Applied Systems from April 23-25 at 1bs Kensington Palace Hotel, London Booking datalis from Jackio Callinge; 815 Applied Systems, York House, 199 Wostminater Bridge Road, London, SEI 7UT, Tel: 01-633 6866.

633 0866.
A TWO-DAY memory designor's seminar, organised by Intel, will be held at the Salta international Casire, 196 Piccadilly, London, Wt., from April 25-26. The seminar is intended to help organeers design batter eyalems using available claic dynamio ROM and EPROM devices: Applications and details from the Seminar Registrar, Tol. Oxford 771431.

HEWLETT-PACKARD is to hold I we one day seminare for engineers working on opto-olse route applications, at the National Combuiling Centre in Menches, ter on April 22 and the Royaf Carden Hotel in Lordon on April 30. Topics will cover fibre apriles, potacoursiers and optical securiting. Further del sill, the available from Mayle Ballingar. Tel: \$724, 78474.

COMPUTER fraud is the thomo of a one-day seminar to be held on May 3 designed to assist mentor businessmen, their pro-

This follows the fifty workshop on melhodology in computer graphics which took place in Saillac, France in 1976. The second workshop aimr to solve some of the problemr in understanding the psychological implications of interaction. Detaile may be obtained from Professor F.R.A. Hoppgood, Seillac II workshop, at the Rutherford Laboratory. Tel: 0235 21900 ext 372.

TMSA and TTB are eponsoring two separate two-day events. Managing soli-ware projects and software cort erlinisting will both be held in London on May 14-15, and in Ganeva on May 17-18. For further information contact TMSA/ TTS, TMSA software seminars, c/a State of the Art Ltd, Victoria House, Suite 501. Southamptan Row, London, WC19 4EJ. Tel: 01-404 4793.

BIS-DELTAK has chosen the thame of the impact of computers on productivity for its 1979 international training conference. Speakerr will include Dr Rhoder Boyson, MP. Or James Mertin and Michael Jackson, who will discuss tha implications of changes taking place in data processing systems technology and the increasing demand for skilled DP professionsis. The conterdates will lake place at the Sharatan Skylina Hotel. London. Airport from Moy 21-23, for further details contact the Regirtur (15:-Detail, 17:101-28; 9760. BIS-DELTAK has chosen the thame of

A WORKSHOP designed to hastst librarians to deploit research fladings, him been organised by the Library and Information group. It is entitled Exploiting readers at IRC workshop, and the speakers include J.M. British. C. Harris, L. Mowat and E. Whalley. The workshop will take place from Juna 22-24 et Huntercomb, Manor, Taplow, Berkehte, and details play be obtained from Alm. Concert Co. Department of Library. Studies Loughborough University, Latestambire. Tel. 600 60171 out 312.

Computers are not an exception to regulation ___ centralised



Threat posed by govt databases

which I and others have raise

Since I believe that privacy in

are very concerned that ad

argument should be treated as

scrupulous and thought

As I said in my earlier letter

helieve that the publics me

warry about computers as

crivacy is "with the threat now

lutabases and with the slow he

stendy move towards a que

police state". Nothing that

have read, either in the Pres

generally or from what John

tem has sald, has begon to co

vince me that this view is not

clarmist and that we should be

the future with anything ba

Many of the arguments n-

pressed about privacy seems

rue to reveal an unbelieur

degree of naiveté. A pice

example is the oft-quoted rate

that "il you are innocentica

you have nothing to feet. Its

is a dangerous and stool this

to make in a world whee his

the past 50 years, misse of

mmocent people have beat-

ter minated merely because-

relonged to a particular &

I find equally curious these

tion that computers offer

serious threat to pers

privacy, and that the same a

blenis will exist whether the

are computers or not. As Jobs

ton, apparently in agreent with this idea, says: "Hills

mannged perfectly well with

could similarly add that His

also mininged perfectly at

without nuclear weapons, ba

this would surely not then be

us to the absurd conclusion that

We have nothing to fear from

Information gives people if

information-handling capabil

information-handing expected of the computer this power car (and will) be enormously increased. The power will be used in the future both to benefit is inclividual and society and is and earth of the computer of the care o

to invado privacy and earl control over people's lives was kind of a society we shall state the control over people's lives was the control over people's lives was the control over the control

tually creote for ourselful remains to be seen. The press

trends are not encouraging.

Midlethlan.

JOHN WELFORD

nuclear weapons.

centralised governmen

serious and important subjections

HAVING studied Rory John-

THE article by Rory Johnston (CW, March 8) ends with the old we later had to receive some speed limits allow. Regulating laws. So am I, but I don't want to example from the introduction of motor curs when there was a law which required that each car ways positive technology. had to be preceded by a man Moat of us, including those wniking down the rond carrying.

a red flag. I have used that example for years in speeches, but I usually add. This rule was aholished because we got used to the car, which suddenly could go faster than the man.

For the moment, data protection legislation in various countries is one woy to pilot the development of computerisation into a structure acceptable to the citizens. Some day these laws will prohably be abolished. But what will we get instead? The "red flag" rule was replaced by some of the most extensive citizens or society. Let's face and often very bureaucratic leg- realities: We monufacture cars

extra bills, charging us the negative impacts of one in many

running computers at specds fnater than mun ever could process information, accept society's demand for yearly car conrols, rules about anti-pollution devices, licensing of drivers, speed limits, security equipment, limitations on vehicle size, penal codes for drunk drivers. Such legislatinn has become as natural to us as many other laws without which we cannot

Computers are not an exception to regulation. Looking into other sectors of technology, one finds much legisintion to protect

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very reasonable cost.

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it through Atlantic.

lease term.

other technologies is, however, keep them in force longer not a reason by itself to regulate than necessary.

If Rory Johnston realises: that computerisation is changing the world; that computer sation has a tendency to marry other technologies, such as telecommunications; that such marriages have already meant a revolution, an information explosion; that development of computerisation ia far from being at an end, not even at the beginning of the end - perhops just at the end of the beginning; that man many times before has faced new ages, developing very slowly compared with today, but cnusing future shocks, and that many believe that society today cannot afford such shocks -

WIN

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Atlantic's Rental or

months).

as it arrives.

shorter lead time.

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*FLEXLEASE with the option

to upgrade to your 4300 as soon

*We may be able to supply a

new 4300 direct from IBM on a

Datainspektionen

ston's further comments on the privacy issue (CW, March 22), I JAN FREESE Director-General am not satisfied that he has adequately responded to points argument and counter Stockholm, Sweden

The law already protects data

RORY JOHNSTON's article Data Protection Lnws - the Real Threat (CW, March 8) cannot be ollowed to pass without comment. Firstly, the more general law does now protect data. Dishonestly to copy, erase or alter data in a system is probably an offence against the Theft Act 1968; the civil law of copyright, patent and tas Johnston himself points out) defamation, all have applications in the computing world. The arguments advanced by Johnston apply then he would be happy that we equally to these fields, yet no one suggests that these laws are

> the duty upon them. Finally, while the dishonest operator, programmer or system analyst may ultimately defeat any system, there are hardware, software and managerial techniques available to make the task very difficult. These techniques ure flexible, and, properly npplied, so improve the efficiency and security of the system that they are cost effec-

France, Germany, Sweden and Norway in Europe all have dain protection laws, with (under one name of mather) duta protection authorities. The laws are backed by crimbual smetions, which are sometimes severe - in France from next January fines of up to 2,000,000 fruncs and/or nne- to 5-year pil sentences come into effect. These laws restrict the flow of data to countries where there is no comparable protection. Were this country to stand alonf we would not be a date haven hat a

M. HELY Stoka Poges, Berks

Secondly, a clear statement of inw imposing standards and duties on those concerned with data processing will command the natural chedience of the vast majority. Practices that are now tolerated will be seen to be wrong and will be eschewed unless the proportion of dis-honest individudals is higher in the computing world than elsewhere. There are many areas of life where inspectors have the right to examine the way in which work is carried on, from weights and incusures to lactories - and most are backed by erlatinul sunctions. People cooperate because the law impress

Pleasey Talacommunications

Rory Johnston replies

MR FREESE and I differ on a basic issue of principle. He stated his philosophy ihus at a conference on cross-border doto flow fCW, Decamber 14, 1978): "You must regulate the free flow of doto so it will flow free."

I disogree fundomanically. Regulations in this case can only hinder communication; we are not dealing here with motor cars that get into irraffic joms. Governments all over the world are moving towards the imposition of controls on their media and information courses, and I and mony others, including Lord McGregor (CW. Morch 29) think this threat to free epeech is very sinister.

Cling other aspects of technology that are regulated in o pagament for I disogree fundomaniolly. Regulolions in this case can only hinder
communication; we ore not dealing
here with motor cars thot get into
traffic jems. Governments oil over
the world ore moving towards the
imposition of controls on their medio
and information cources, and I ond
mony others, including Lord McGregor (CW. Morch 29) think this threat
to free epeech is very sinjster.
Cling other aspects of technology
that are regulated to to argument for
regulating computars, aince for
every machina that is regulated
there are asveral others that are not
Molor cars only have to be registered
when on the public highway, not
when driving by your own property.
Washing machines are

College with 100% LINES record on jobs To: The Editor, Computer Weekly,

I WAS interested to read the article on the NCC Threshold course, and in particular to read of the "DP manager, who asked that his name be withheld" and who "was very disappointed" at the generality and superficiality of the course (CW, February 22).

Notwit has ever claimed that Nobody has ever claimed that the Threshold course can turn

tyros into fully competent and experienced programmers or operators overnight; what it does do is first of all to find those who can benefit from the training provided and who possess a proven aptitude for DP work and then provide a foirly broad basis for their future career, and in particular to provide specific training for operations

and programming.

It is clear that the majority of other DP managers in this area would not agree with the anon-ymous speaker, for the students from this coilege following the same course are proving very successful in gaining employment and in fact every one of the 21 students who left us in August 1978 gained DP job ... a 00 per cent record not easy to

equal anywhere. Follow-up of our other Threshold students over the past two years has revealed that all are proving to be better than average and that employers are very pleased with the progress being made.

If any local DP manager would like to visit us at Dudley and meet staff and Threshold students he will be made very welcome, whether he is just curious as to the pattern of training or the potential avail-able, whether he is looking for trainee/junior staff or whether he is prepared to help by providing the relevant works ex-

penence aspect of the course.
I would like to think that the "anonymous DP manager" would accept this offer. B.A.S. PATTERSON

Depuly Head Department of Mathematica and Dudley Technical College

THE EDITOR welcomes lettors commenting on aubjects published in Computer Weekly, or an original topics. All letters must be accompanied by the writer's name and address, not recessedly for publication.

A collar and tie policy for ops

Majesty's Services' computer output leaves a lot to be desired.

other day containing some Pre-

mium Bond winnings. I was ab-

solutely amazed at the "wavy

line" printing, I would imagine

that the operators who pro-duced that document don't hold

BARRY DENYER,

with the collar and tle idea.

Lloyd's Bank

Worthing.

Registrar's Dept.,

Having a letter from Emie the

Dorset House, Stamford Street, London SE1 9LU

l WAS intrigued by the Item on operators' clothes and mode of dress (Op Spot, March 22, 1979). l agree wholcheartedly with Bernard Allen when he states that this matter is not trivial or too uninportant to warrant the Interest of operators.

Standards must maintained, no matter how high those standards may be, My installation, Lloyds Bank Registrar's, Durrington, insists on a "collor and tie" policy 24 hours a day. The operators accept this policy and after a while it becomes normal. The bank does, however, provide each operator with two white dust jackets free of charge and replaces them every 4-5 years! Unfortunately, the jackets are not made to a very high standard and tend to full to pieces after 3-4 yearst They do protect the operators from various sources of contamination, such as ink from print ribbons which could quite

I think that as our employers are generous enough to give us jackets to protect our clothes. the least that we can do in return is to wear garments sultable to our "banking" image. Which means collar mid tie, but no

easily soil normal clothes.

The standard of output from this installation is of the highest quality (of necessity) and it is my belief that this stems from he fact that the bank demands high standards for everything from nn operator's mode of dress to a certificate of share holding for a mumber of the public.

If you want to check my last statement ubout Lloyds Bank's high stundurd then I suggest that you have a look at any statement or certificate issued from one of the computer centres belonging to Lloyds and compare it with one of those very nice lotters from Ernie. Her

-Spare his blushes-

WE recently advertised in Com-puler Waskly for atx cheep YDUa, giving, our telephone number se contact. We ware plasted with the response and did adeal with a bank in London for no less than 10 Undontact for no less then 10. Unfortun-ately, I did not record the iphone number of the gen-man concerned end I em now

in the embarrassing position of having bought 10 VDUs from comeone I can't contact!
Can anybody help to make
my rod face return to its normal

J. S. MCKENZIE

crime and ethics

From page 4

wrong with manipulating a computer program for personal

which he than sold on the black

In the second place it is wortying that juries betray such unconcern over their activities. Witness the young man who leegraph computer to siphon which he than sold on the black.

His sentence? Sixty days in iail in fact he was relaased, for niquas to combat certain for every such rogue locked 10 who would lump at the a technological environment where detection would be virtue.

Adler aims at first time users

A SYSTEM almed at lirot-time users prepared to take on a VOU/floppy disc machine from the stert rother then betng wasned on mognetic ledger cards, has been introduced by Adier Susiness Systems. Colled the TA 1100 hardware includes o microprocessor based CPU with a 24K byte ROM for cystem acftware and 16K of user memory, twin floppy disc drivos each holding 456K byteo, o VDU that shows 22 lines of 4S characters and s 20 chps golf bell printer with microprocessor optimised bi-directional printing.

Stondard software packs gso offered with the TA 1100 cover

applications like soles tedger accounting with invoice produc-tion and stock control, purchase and nominal ledger occounting with cash control, and payroll accounting for hourly, waskly or

The £9,500 price includes one softwere package of the user's choice and additional programs

ABS sayo that the TA 1100 k simed at firms with a tumover of up to £1 million and the company

from the existing library era £600

plans to demonstrate the system at private exhibitions to be hald in May and Juns in London, Siminghem, Manchester, Leads, Edinburgh and Glasgow.

Lancs hospital adapts Argus for path lab work

THE Royal Lancaster Infirmary's pathology lah has acquired a Formuti Argus 700 minlcomputer which will cut out much of the clerical work involved in the production of medical reports.

The system accepts data produced by laboratory instru-

forms mathematical correlation of a series of tests and produces reports, at the same time storing historical and statistical data on

ments, corrects for drift, per-

The sulte of programs was originally developed at Ham - name of Delphi-Phoenix.

neismith Hospital, West Lon It was acquired by the North-West Regional Health Authority which modified it for running on Its own Ferranti Argus minicomputer and gave it the

AL believes this 1200 bps modem is streets ahead

mdo you? Many users believe the IAL 1200 EP to be the

The IAL 1200 is designed for trouble-free, automatic, unattended operation. It accepts 600 or 1200 bps synchronous or up to 1200 bps asynchronous digital data, modulates it using Frequency Shift Keying, and transmits the FSK signal over 2- or 4-wire leased

best 1200 bps modem on the market. With good

Diagnostic functions are a built-in feature of the IAL 1200. VF local loopback and digital loopback, allow local and remote modems and the line to be tested. Visual indicators for the V.24 signals which include Transmitted Data, Received Data, Request to Send,

Ready for Sending and Carner Detect as well as Power On and Test are located on the front panel for easy The 1200 EP is of single card construction.

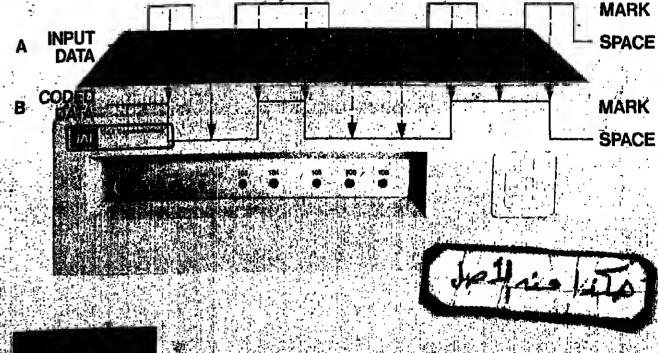
utilising LSI technology and is available stand alone as shown here, or in the rack-mounted EPR version.



Sixteen 1200 EPR moderns can be packaged into each 19" shelf and, if required, intermixed with the IAL 2400 EPR modern. Rack-mounting is, of course, more usual at central data processing sites.

Compatible with CCITT V23, V24 & 28 standards, proven in applications throughout the world, the JAL 1200 EP is inexpensive - and exceptional value for money Ask us about it.

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French seek end to incompatibility

proposed standards for videutex ween the UK Post Office, the services hased on the feeling Bundespost and the CCETT that they will in future linve to interwork with uther services stanoarda for European such as telex, teletex and facnile, not to mention teletext which Bernard Marti, the author of the article on the French systeins, refers to as "brundeast

Studies on broadcast videotex started in the CCETT, the Centre Commun d'Etudes de Television et Telecommunications, at Rennes, France, in late 1973, primarily because the UK teletext system was regarded as ino closed and integrated to be

The first stage of Antiope, the development of a modified television receiver, led to the implementation of a packet switched broadcasting network which was used to offer an experimental stock exchange information service in May 1977.

By August, CCETT was abie to demonstrate on interactive system at the Berlin Radio Fair. The system was itnked to a simple database on its lmealaring service in Rennes by a leased line, via a terminal oncentrator in Beriln.

teams to define possible videotex. A solution was produced which allowed coinpatibility at display level, and when this was amended in a CEPT meeting in March 1978 it was supported by six administrations excluding the UK, and it now forms the basis on which French manufacturers are wor-

Antiope uses 16 bits per charocter, which enables colour and flashing to be set for each character independently, instead of readily adapted to French, by a separate control character, which creates a space on the screen where it is used. By using the microprocessor in the set. viewdata codes can be converted to the codes used by Antiope systems, the database Titan and the videotex service

It is hoped that international standards will be agreed before French manufacturers go into production for the introduction of the public broadcast videotex service in 1980, as well as the videotex for 3,000 users in Velizy near Paris. The manufacturers feel the deadline is this month or

Donald Kennett surveys viewdata/videotex

The race is on to set standards and reach mass market

The thorse of standards for slocironic information systems of all kinds, to point in mass producing sots until there is a public service to set standards for slocironic information systems, to stimulate mass over ways of integrating different systems, to stimulate mass that for example, the Taxes instruments decoder needs beginning.

Ine Post Office Jesse year, which it says is more than adequate for the sumber of terminals in the field, but at the same time it has discouraged rganisations whose use of the system would be "excessive," such as the tock Exchange, betting organisations and suppliers of coin-operated

ublic terminale. Coin terminol manufacturer Cherry Loisure's markating manager, Richard Davies said it would not be worthwille setting up production for fewer than 100 sets and the Post Office had limited it to six initially and 30 from the launch last month of the partiol public service for domestic users

VIEWDATA and other electronic Information services seem polsed to enter our lives on o large scale, but how much effect they have on us will depend on now cheap and how easy they are to use both for information providers and end users.

Cheapness and case of use arc needed to set up up a snowball effect in which greater use stimulates the provision of more information and other services. more chhancements to user equipment and yet cheaper products. Without this kind of interactive growth it is doubtful whether information provision can be profitable.

These considerations form t of the overview by Richard Clurk of newly-formed information consultants Joan de Sinith articles in the April issue of Computer Communications* covering progress in aeverai. countries on viewdoth, or Canadian studies into high videotex as the various versions resolution graphics on videotex

cater for this.

The future is also seen as bringing the possibility of videotex terminals which will generate graphic images, using he picture description inatructions or PDis now being experimented with, and manipulating them using picture more economic than the chamanipulation instructions or Mia such as rotate, scale down

scover ways of integrating different systems, to strike the for example, the Texes instruments decoder module can only different and the mass market.

The Post Office Prestel system has had 80 ports available for its test

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The Post Office Prestel system has had 80 ports available for its test fo

loreign sot mekers who from September will be allowed to sell steps sets for use with the service, eo long se they mest the Post Office's win and technical requirements. The UK set makers are not keen to but staction of their agreement with the Post Office which owing then, but the alternative is that viewdata, the system which prompted nent of many other versions of videotex all over the work a ose its leed and see another implementation class up the world mile

with facsimile systems, as well

as better image display, whereas

Australia, South Africa, Hong

Kong and the USSR are all in-

teractive videotex systems,

Clark mentions the narrowband

broudcast or teletext services.

one of which is in Germany and

confusingly known as Videraext

with the extra "t". Other related

categories are wideband broad-

services. Outside the four cate-

gorles other communications

services at their own develop-

ment path are expected to merge

eventually and therefore must

be taken into account as early as

possible, but the details of the

merging cannut yet he foreseen.

These include telex and its en-

Swedes test Nova

based DataVision

hanced future version for com-

General Nova supplied to the

elecommunicotions as a turn-

terninala for tho 15 information

apability and were develuped

onother Swedish company,

The system, colled DetaVI-

sion, was initiated after discus-

sions with the UK Post Office,

but is being developed indepen-

dently in sevaral stages. After

atarting with a one-woy infor-

mation service, interactive wor-

king will be added, followed by

Alongside the nurrowband lu-

terested in simple systems.

municating word processon

terred to, again confusingly, a

Wideband systems use em

carrying capacity either a

hroudcast something the sign

frames of information perche

nel (instead of about 100 as

narrowband system), or th

can carry n full video signalite

only has to be demodulated

go on the screen insteadofber

lesculed as characterstober-

In the generation of a view

signed in the set. Examplest

chille Qube in the US, Captar

in Japan and Reuters Monitor

hrandenst teletext services:

clude Ceefax and Oradeine

UK. Biblos in Belgiom. ?!

schirmzeitung and Videora

West Germany, Text-B

mark and Holland.

Sweden and Teletext is be

Problems which could a:

setbacks to any of the vi

systems include potentia.

responsibilities for defant

or absecte material, discrit:

tion against information pa-

ders, copyright issues and ...

vertising standards, Pies:

legal boundaries being

have to be redefined, to

regulation of message senio

broudensters and publish

Examples of narrower:

2 About 20 during 1979 Prestal computars User ports (linea into 84 4,000 during 1979 computers)
Information providing 154 0 (waiting list about 70) 95,500 3,500/weak 30-50/waak last users 100 on PO end

TV-company premises) Table 1: Post Office viawdata statistics (UK)

are collectively known interna- aim to provide interworking tionally. Clark sets the Interacvices in the context of the broader field of electronic publishing.

The competition between systems is reflected in the competition between priorities in standardisation work. Ease of Implementation vies with compatibility, both with existing with likely future text transmis-.. slon atandards.

Canadian studies into high cast and wideband interactive

Canadian service aims at integration

THE proposed Canadian low reactution terminal it videotex service is now called executes them as low resolution Telidon, and its developers are. The PDi method requires o working on it with an eye to the PDI processor in the terminal, future. A major element of that but at current LSi prices it is future is seen as integration with claimed to be pussible in build a future services and to this end reusonably advanced terminal they ore catering for high within the buying power of the resolution graphics, as well as average consumer. As prices aiming for independence of as continue to fall, mora powerful many elements of the total aya- commond sets will become tem as possible, including the database access method, the communication medium and the terminai capabilities.

and transpose.

An imaga could be transmit ted to another aultable tarminal and the users, say an architect and his client, could manipulate the aama image convarsationaily using joyaticka or light-pens, with only the modifications passing between terminals as PMis, instead of renewing the whole image each tima.

whole image each tima.

Tranamission of information in Telidon uses standard seven-bit code plus parity and the Shift Out control character defined in ISO 648 to change to graphics mode. It is designed to be compatible with extering business terminals and the emerging teletic international standards as well as videotex.

If a terminal cannot handle the graphics of the property of

economical and the design includes extension procedures to

Central Administration of The method la also suitable for key system by the Swedish company AU System AB. The facsimile tranamiasiona; resolution is typically to 12 bits, or 1 in 4,096, in a five-byte PDi opera-tion code with data. This is voripruviders hove local editing

Even with five bytes per instruction the PDi method can be racter method used in viawdata terminais.

A note on terms

IT is interesting to note that the suffices of the stilling on Canada's proposed system say that the name videotax has been adopted internationally as a temporary generic name for public-accessed, intersetive information-ratrieval services

gan in June.

The sistem software runs on a Digital Equipment PDF-11 under RSX-11M V3, and while the domestic terminals are similar to Prestel sets, the business terminals are black and white:

and then e simple telegrant service is based on a Data

if these tests prove subtraction, a market trial with the i,000 usors may be held of year or the year after A public service could then be troduced around 1983.
Field trial of a teletal sub-called Text TV is scheduli.

this year in the homes deaf people, to provide aubtitles to talevisies for A spacial com been sat up by the Said Government to investigate full range of public laters systems including all places. transmission, known in the wideband applications

aiternatives to tree-searching Finns try out Telset

FINLAND has a test viewdata sarvice called Telaet with 1,000 from 75 to 9,800 50% The plan is to dev frames and 30 usars, the rasult of tem sultable for a town of 1600 a co-operative venture by three companies which began in 1973, soon after details of the UK Post inhabitanta pains 20 The would then be dupi Office's work were published. Last year the aystem waa modified to be compatible with Prestel and the teat aervice be-

Confident that a billion dollar income figure will be passed this year, PAUL FLY, Hewlett-Packard's computer sys-

tems division vice-president (right) talked to ROBIN WEBSTER about the (company's philosophy and future plans.

Hewlett-Packard finds its role

"In a sense we want to be

"It probably won't happen be-

cause we grow to be larger than,

say, IBM. . . that is an unlikely

smile. "i'm not sure that it is

even a good atrategy for us to

state or think of a goal like out-

growing DEC. It is already twice

our size as a computer company

and has a strong management

and a proven record of growth.

think we can be number one in

the eyes of certain kinds of cus-

toniers instead; I think we

already are in a number of

"If somebody is thinking of

reputation required. . . with our

desk-top range we clearly have a

middle of the technical market.

while we have a position of strength with the HP1000, in

come up against DEC quite

strongly. Some people would

define being first os total mens-

urement of market share, but we

Any company wishing to ad-vince must consider the sym-

blotle relationship of hardware

these Hewlett-Pockard adds a

third factor-the user. So a

system involving all three, is

"triangle", a carefully balanced

"Today, whan things like tha

shortage of trained software

staff ilmit user applications, we

ore trying to moke it easier for

the operation of our computera.

skills, you only need to know

this very powarful tool.

afternoon to laarn how to use

Is this where the micro-

"Well, no, not really, and it

just depends on your view. My

view is that the mioroprocessor

is just one more atep in a logical

application point of viaw, the

make quite a change in what we

can do, but I don't think it has

changed our concept of com-putars. They don't look a lot different, it is our paripherals that have been affected mainly.

changes in company attitude?

in some peculiar ways."

think that markets are defined

event," he continued with

in the past, has had to overcome was the expected promotion to something of an identity crisia in the Billion Dollar Computer seems of product range and Company Club Indicative of a more careful reasoning? market share, Hewlett-Packard

Describing the company as number one," said Ely, "but the low profile", Paul Ely. Hewiett- sense in which we would like to Packard's computer systems be number one is not the condivision vice president under states the advances the company has already made, and is tending to make over the next few years, but that is because he 100 is part of that nonaggressive strategy.

"It is our expectation that we will be the next billion dollor computer company this year," he said confidently. "That is our tated goal, and our perforgives us great courage that we will easily aurpass that figure.

last 18 months has been to have a very balanced programme. No single element has fuelled most Were there any plans to change this approach and rely

on just a few products for revenue, or to carve out a large chunk of the market with a major new product announce. "No, I doo't think so," replied

Ely, "I feel that the kind of growth I am talking about cannot be achieved with one product. We expect to add a quarter of a million dollars to our computer business this year and you don't do that with one product-or maybe you do, but i don't want to bet on it. would much rather do that

kind of thing with four or five products, all of which are ming along nicaly. This kind of strategy allowa us to continuupgrade our business in each of those product lines, which is a Hewlett-Pockord tail We don't want to surprisc the market by making o major investment and then popping out the product to acc what

With that in mind, has Hewlett-Packard defined future product targets?

"Yes, I think we have," sold Ely. We feel tha kind of pro-ducts Hewlett-Packard has today represent a very pro-mising area for us, and thay are therefore something we should stick with an area tick with as opposed to branching out into quita dif-

Several years ago, with the gart-up of our HP3000 range, we law fast growth in the business data and distributed data protessing areas - in of our total business. On the other hand the before the micro and which will continue wher hand, the HP1000 has been micro and which will continue on beyond it. Certainly from an saming momantum too; vary Cable growth ratea are availability of the micro might being achieved with that pro-

Al present, the company splits computer systams division ino two main areas, tha technical and business computer familian white lies which provide \$750 million

ithat have been affected mainly that have been affected mainly. There is now more power in our incomist of both daak-top and technical minicomputers, total computer business, while about ona-third of our bust-Did Hawlatt Backard's strategy, go as far as mounting that have been affected mainly that have been a annually.
Technical producta, which consist of both daak-top and technical minicomputers, account for about 50% of our the data processing lina givea ua about ona-third of our bust-

we feel that for two reasons it would not be a good choice. We think that we have a proprietary advantage in the process technology and therefore see no reason to give our competitors the opportunity to use it. It would also be wrong of us to limit our production facility to any parti-cular circuit. The hardware

of date technology." troductions like the HP 45 are doing very well: has this success raised the idea of a "home com puter" product line?

alters so rapidly that If we did

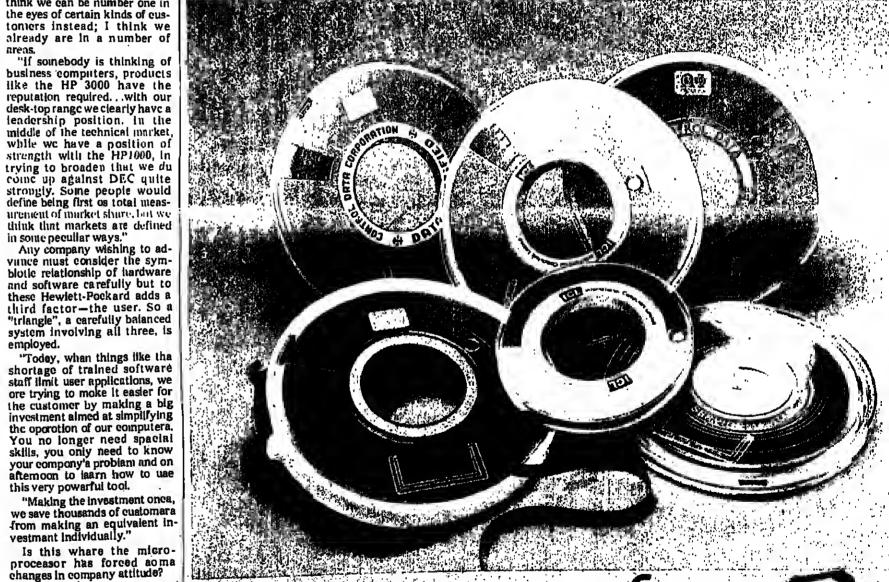
that, we would be producing out

"If you look at some of our

hand-held and desk-top calculators, they are frequently used as small business systems. The tind of thing you can get in the US for about \$600 is not really useable in that way. You have to get more memory, which costa about another \$1,000, then you need a printing device. if you want to run it quickly you have to get floppy discs. . So by the time you have finished, you have spent several thousand dollars.

"i imaginc what will huppen is that in three or four years' time we could make o HP35 oyallabte at a third of the price it sells for now. We have no real aspirations to go after the home com





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Interpretation of the products. And the backing of Britain
in cest sales and technical support force.

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specifically for technical people who are designing, developing

publications do notreach

London, SE1. Tslephone 01-231 8495.

OP SPOT

Everybody benefits from the open shop system

programming stuff to work in the same area, but they used to do so at an installation where I was once employed as an

We ran an open shap system for developinent work. From the start of the day shift until about 4.30 pm, one of the systems was dedicated solely to testing.

The programmers were allowed into the printer room where they had oocess to card punch, card reader and VDU, so that they could feed their work to the system and monitor its progress.

It was up to the operators to take the

Union asks for

eye tests

THE National Union of Asnk

Employees has asked the National Westminater Sank to give regular aya tests to sil its staff involved in the operation of visual display units.

NUAE made the request fol-

the bank's employees hed ox-perienced headsches and diffi-

ting reports that severel of

Centre

Rogier,

International

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European showcase for small computers, micro-

world and particularly from Western Europe.

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Ploase sord rite FREE pre-registration tickets for Compec Europe, which will save me having to pay BFr 200 at the door.

THE REAL PROPERTY AND THE PARTY AND THE PART

Held in Brussels, it draws visitors from all over the

processors, peripherals and terminals.

hand it to the programmera.

The system worked extremely well there was little bickering between members of the two departments, and each gained from the presance of the other.

The programmers got a quick turnround of work and were able to call upon the expertise of the senior operatora when they came up against job control language problems

We operators liked the set-up because we were able to prepare and run our own jobs, using the facilitles present. Needless to say we weren't supposed to do so.

system, as we did at that particular in-stallation, you tend to get a bit bored with each other's company. So talking to the programmers made a rather pleasant

> As I have already mentioned, the open shop testing was scheduled to close at 4.30 pin every day in order to make wny for live work. It was difficult to do this as there was one person who always insisted on having "one more shot."

Curlously enough, he wus not a programmer but one of the members of a technical aupport group - a person who

therefore could appreciate the need to keep to the work schedule.

A particularly niggly little character. he would complain constantly to the trainers about both print quality and the line-up of stationery. Until, that is, one of my collengues had a quiet word with him. pointing out the error of his ways. After thot, he was fine, no trouble.

By Bernard Allen

Anyway, I would like to hear your views no communication between opentors and programmers. What does each

Struggle for life of the **BCS Specialist Group**

of the British Computer Society

Despite the fact that the group

An operations specialist with Infotech, he told me, "The reason we haven't been meeting is thut we have had a lot of organ-

isational type problems." Since last May, several of the group's committee members secretory Peter Davis has resig-

Said Patman, "We have had a lot of troubic finding a replacement for Peter Davis. We are

They want someone who can give up a "considerable" nmount of time to the work, is able to communicate with staff at all levels, and has uccess to secreturial fucilities.

He continued, "A couple of our members have offered to on the subject matter of future take the job, but they both work meetings.

outside London. Ideally, we Sadly, I must report that

ding to chairman Barry Patman. technic of Central London.

where we hold our meetings." in his view, the group is operations staff the chance to meet and discuss their work, and is "the only one" of its kind.

He continued, "In the course have changed their joba, ond of my work, I get a lot of interested in learning more about

"We are looking to establish something which will represent operations staff of all levels. We don't wnnt it to consist of managers only.

He is involved in the process of sending out a newsletter to members of the group to keep tham informed about the sltuation and osk for their opinions

Your letters should be sent to Op Spot, Computer Weekly, Dorsot House, Stemford Street ondon SE1 ALU. Telephone celle ere equally welcome end Bernord cen be contected

operations group, has finally

After a hright start in Fehruimportant because it gives nry last year, the group had difficulty in attracting new members and as a result lost its

Apparently, pressure of work and the demands of working shifts prevented many of its members from attending group neetings on o regular basis.

The group carried out a number of projects, including a survey, commissioned by Computer Weekly, into the computer moon environment. That involved contacting over 40 installations in and around the Coventry

In addition, many of its membars were deeply concerned about the lnck of training available for many operators, and were involved in drawing up a report on the subject.

Operators often compinin that nobody ilstone to their point of view. Woll, Op Spot is listening and Bernard Allen would like to hoer you opinione and Idons on oil matters releting to computer

The system has 725 users, 8 runs on o single dial-up PR 11/70 with standard DEC VDL The software is Come he Computer Corp of America

Electronic mail surveillance Warning

THE prospect of a severe regulated environment happy over the future of electron mail is getting increasingly serious, occording to Russ. Pipe, a US commentator e communications and law. Speaking to an ISL cor

terence, From Facsimile to Es tronic Mail. Pipe cited a lar number of national gover-ments that are considering co. trol of Information cross their borders, for purposes laxation and nation Servereignty as well as private.

Many national authorities

communications

Blacking of business biogra

tion transferring even whice

ompany is a "handy new ye-

tice", necording to Pipe & quoted Swedish leaders a

saying "The critical most

Swedish political economics:

social data should not leave :

Countries are also considera

imposing import dutiesbad-

the value of the content

formation, rather than-

medium of transmission?

will entail government mys-

tions of the content of High

ational messages, even to

and large, to be free .

Another speaker at the forence, Claire Messler of De-

Equipment, disclosed that ap-

electronic mail system runs:

within the company in

Junuary, 1978 had increase. users' productivity by attach 5%-15%, cut phone calls by 15 und inter-office memos by 21

internal messages contin-

territory.

Pipe sald, are turning from & minicomputar and terminala long-held principle of free z' division. open communication towns the monitoring of electron Transaction proceeding is one of the requirements for e distributed system. Our photograph shows a transaction processing canfiguration based on a Level 8 mini using messages crossing frontier This leads to much uncertien about how electronic mail or develop, particularly is the minds of those in internation: compunies who are thinking introducing It to improve the

one of Honeywell's latest applica-tion packages, TPS-8.

that axisting users do not leave the fold.

This is done by providing competitive

products and aarvicaa thet maet the

tinua to meat them as their needs avolve and change, ea

wall as anticing users of

competitive equipment into

Against this beckdrop,

Norton diacussas how

minicomputars can play an

Important role in the mein-

frema suppliars' stratagies

amphasising thair rola in

Norton is the marketing

oparations and planning

managar of Honaywall'a

distributed processing.

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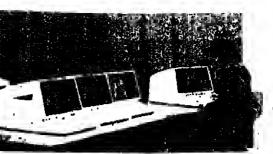
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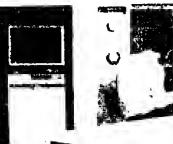
The NSC suite of packages. Used 'stand alone' or fully integrated



A MAJOR meinframe vendor is motivated, as are most businesses, by the bealc need to mainteln and grow revanues and profita, saya Honaywell's DAVID NORTON. Ha bailevaa that in line with this fundamental objective, a vandor's principal concarn will be to ansura

HOW THE MINI CAN BENEFIT THE MAINFRAME SUPPLIER







usars' current raquirements and con-Manufacturers' key to expanding markets

overworked of buzz phraseology concerns "distributed processing" and "dlatributed systems". Despite, or maybe as a result of this, distributed systems are a reality. The philosophy they represent is here to stay and offers the user real

Data processing has evolved from the early batch era to the

la becoming accustomed to, Immediate access to information and processing capability from his place of work.

Of course, meeting those de-

mands is no problem for the mainframe supplier - just increase the size of the central site and install a network of ter-

There are drawbacks to this approach, however. Communications operating costs may be high, response times may not be all that is required, and central systems are complex to operate and maintain. But perhaps the most aignificant factor of all in the user's eyes is that he does not feel that he controls his computing needs.

This factor, the desire for autonomy, can be the prime approach. Further support comes from the offsetting of the other centralised system disad-

This trend towards other user group,, in an organisation naving its own computers has been actively encouraged by the specialiat minicomputer ven-

fors. Thay have come to oppreciate the feeling of local ndependence from the central service organisation, the costeffective business solution approach. The message is

fraditional mainframers' bualness significant.

Possessing a strong minicomputer product nllows the mainframe supplier to respond to this challenge in kind, however. Systems solutions can be off-

ercd using minis and mulnframes combining the control of a centralised mulnframe system and the effectiveness of the distributed approach.

For the mainframer to respond to the market today it is essential that he be able to provide the degree of distribution necessary for the user's style of operation, making the system fit the organisation rather than the reverse - and the inlnicomputer is the key to this

capohility.
Within such a mainframeassociated distributed system minicomputers will be found pluying many roles: as a frontend communications processor. as a routine device in complex networks, supporting slipple remote functions such as remote

proapective purchasers will already be users of competitive entry, and as a comprehensive sntellite processor providing mainframe equipment local users with their own batch and transaction processing useful in their own right, will

represent an ideal vehicle for The supplier is also in a posidemonstrating the merits of tion to satisfy his user's standdealing with a different comnlone systems needs with the advantages of a single source for supply and maintenance and inherent compatibility between mainframe and mini should it he

By the same token he can sell minis to users of competitive

The market for minicomputers is growing at about 30% per onnum and, os such, represents the most rapidly expanding business area for the

miniconyputer independent

Where better for the established mainframer to look for increased revenues, the more so since some of the business undoubtedly will come from existing users and would otherwise possibly be lost to a

associated networks. The moinframe's mini appears within high volume output printing systems, as the "engine" within industry - specific

Competing within the fast evolving minicomputer market provides a technology spur having spin-off across the whole spectrum of a mainframe sup-

A routine for program library reorganisation A DISC program library reor-ganisation package which in live library reorganisation time to

being marketed by CHC Soft-ware of Reuding. Called ZLIB, it is intended for use on ICL 1900s and on 2903/4, and 2950s, 60s and 70a running under DME.

Tony Etherington, oparationa manager at a Department of Health and Social Security alte In London, told me, "As an operations menager at a 2903/4 alte I was very interested in the cinims made for this routine and so we took it on a trial basis. I

operation has cut run time from one minute - it took 40 minutes 40 minutes to one minute, is using the standard ICL routing

According to Etherlngton, the routine olso has a fucility for permanently clinngling programi priorities, which is especially uscful for bootstrnp loader

He also says the listing produced by ZLIa is superior because it goes across the page and duplicate programs are high-

Paper de-leafing

UP goes the printer lid and paper spows out scrose the floor — it's a paper wreck. Not a pratty sight, perticularly at the end of a long sight-hour shift.

sight-hour shift.

The unfortunate operator tending the unit must pick up the paper from the fleor — folding it needly, of course — sort out the inevitable mess at the back of the printer, re-align the stationary, end instruct the system to re-print the "lost" output.

Paper wrecks can be caused by faulte in the device, or by poor operating such as setting the stacker incorrectly or felling to cloer the output often enough.

But when two- or three-part listing is involved, wrecks may be the result of the paper coming spart, or de-leafing es it is known. When this happens, it tends to get caught up in the stocker rollare.

So each time you open a new box of stetlonery check that the paper is in good condition. If it is not, mark it as unusable and inform your operations manager or whoever is responsible for buying it.

Op Spot accused of bias

A NUMBER of you have said system; it's as simple as that that this column tends to favour Rut I have hothing against

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IPC Elactrical-Elactronic Praas Ltd., tha world's largaat publishars of computar, atactrical and alactronic journals, have made spacial arrangements for readars wishing to viait tha Includaa - traval by achedulad airlina from

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pany as a lead to bigger things! For most mainframe suppliers i minicomputer provides the basis for extending the product affering into new oreas, for example by the provision of office automotion products, inlegrated with the information processing system and its

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who are displaced by new technology? Following our printer who was made redundant and became a journalist, reports on the technical side of the changes in US newspa-

What happens to workers in Industries such as printing pers (CW, September 21, 1978), JAMES McDONALD, 8

Technology 'victims' turn disaster into a second chance

AN alarming notice greeted the composing room employees of a medium-sized daily newspaper in the eastern United Stotes when they arrived for work nne

Although not an ultimatum. the company informed the 220 employees that, because computerisation of the composing room, 75 jobs whuld be lost within cight months.

The shock was traumntic. Many wondered who would be forced out. Others speculated on the difficulty of trying to live without a inb. ft was finally happening, the workers declored everything the omniscient "they" had said would happen: computers were replacing workers, threatening to place them on public welfare.

After the Initial shock, and when the dust had settled, a unique plan was unfolded.

The company was not aimply firing the 75, but providing them with practical means for continuing as productive citizens. Siace this was o union shop, dismissals were to be voluntary. Alternatively, the compositors with least seniority would be dismissed first.

However, the incentives dollars for five years to anyone frared by the publisher caused dealring to start his own busioffared by the publisher caused no problems in finding workers willing to terminole their

Journal-Bulletin was among the first American doily newspapers to make the switch from hot metal composition to the nowfamiliar cold-type process. During the transition period, less ond leas work was either available to, or required of, the compositors, whose joba were graduolly being eroded by computerisation.

In a mnnoeuvre which could well serve as a model for other employers considering the inspoct of masa layoffa, the Journal-Bulletin offered Incentives which made the prospect of uneinployment more palatable.

per week living expenses during severance pay of 16,000

A COMPUTER WEEKLY

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BY OWEN HANSON

This book provides a brief but euthoritetive review of the most

frequently used file organisation techniques, and of related

subjects such as date security end softwere aids.

The file designer is shown how to choose between the

available techniques on the basis of known or forecast

information rether then rule-of-thumb, and methods of

ensuring that the correct choice has been made ere given

New work carried out by the systems enelysis division of the

City University Business School, London, is linked with

previously published information to provide methods of optimising the performence of sequentiel, direct end indexed

files. Merked improvements can be echievad, perticularly with

direct filas, which ere worthy of widar use than et present.

Students of dete processing, lecturers end prectitioners should

ell find the book invaluable, perticulerly becsuse it provides e great deal of information end many illustrations in e vary

compect formet.

The Providence, Rhode Island

Among the company offers

■ Full-tuition scholarships to a four-year college or university anywhere in the continental United States, plus 200 dollars

• interest-free loans of 25,000

neas, plua the severance pay, and several additional offera incorporating some of the above combinations.

The company publishes two daily newspapers: the moming Journal and the evening Bul letin, each with five editions. On Saturday, both papera are comvidence Sunday Journal is published. With such a heavy production schedule, and despite the layoff of 75 compositors, it is not necessary to point out the effectivaness of computerised newapaper produc-

From a layman's view, how ever, there appear to be some shortcomings in the system. Many readers complain of an Inability to read the smaller sizes of type, a situation which, no doubt, will Improve as further camera or printing refinements

Another problem occurs when paste-up artwork sometimes sllps" out of position and overprints in the wrong place on the

age. Despite theae minor faulta,

vinced that cold-type production is here to stay, and continues to nibble away at the remaining joba in the composing

Since the original 75 compusitors voluntarily terminated their employment, the company offered retraining in other departments to several other com-positors. After 22 years as a compositor. I accepted an offer to be retrained as a staff writer, along with five of my co-workers, in 1977. That same veer, aix more were transformed into advertising aaleamen. An informal survey shows that we are all highly satisfied with our mid-life career changea.

But what about the original 75 who left the company under pressure of computerisation?

A representative sampling lends even the most casual obaerver to conclude that here, indeed, is a happy group of men. Donald Miller always had an

urge to fly a plane, ao he enrolled flying achool at a local airport. At the same time, he operated hia own amall job printing business in the garaga attached to his home. When he tires of the smell of ink or the monotonous clatter of the printing press, he thinks nothing of taking his wife along for the ride whenever a paying customer wants to be flown to a destination.

John Pranckunas and Joseph Lavery decided to become car machanics and annolled in a

trade school for that purpose. Three of the younger excompositors took advantage of college acholarahips. Roger Guevremont chose a buainess collage curriculum, while Ronald Jeffreya aimed at a career in reel estate. Tha third member of the trio, Robert Barker, already posessed a univar-alty dogree in finance. He returned to collega in purault of another degrea in the field of agricultural managemant, after which he will combine his education with a love for farming, pursuing a carear de-voted to efficient food produc-

At the opposite end of the age spectrum, 52-year-old John Choquette choae eerly retirament. While aupporting himaalf on a partial company pension, John maneges a mobile home trailer park near the popular

seashore resort town of Narra-My personal experience & When he reaches normal retlrement age, Chnquette will receive full company pension under the terms of his employ-

terest in furniture refinishing. Among other things, 36-yearold Andy Jennings is keenly interested in physical fitness. This enterprising furmer compositor has combined his acquired management talent with a love for bicycling into a successful business which he named "D. J Handlebars." Along with his wife and children (during school vacation periods and whenever they feel like It), Andy sells and

ment termination. In his spare

time, he has developed an in-

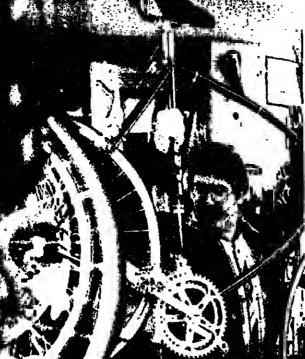
services 10-speed bicycles. The most common remark to be heard nmong these and other former compositors goes like this: "It's like being reburn. If it wera not for computers, I'd sill be focing the dally drudgery of punching o time clock and wolting for the whistle to blow before starting and stapping

Admittedly, without the incentives offcred by their employer, the present stutus of these former compositora prohably would hove been very different.

The foct romolna that the sometimea traumotic result of industrial opplication of computers can be softened when such uac is bninnced ngoinst the socio-economic effect on the working mun. Prasent worldwide inflation is ofton ntiributed to greed among many segments of the businesa community, from producer to consumer. On the nther hand, It is easy to hinne computers for high unemploy-

The reoctiona of these and other workers show that while computers moy be capable of climinating some jobs ond creating new onea, the blame more proparly liea with uncoring or thoughtless companies which ignore thair aocial reaponalbli-

arrangements to visit Telecom '79 PC Electrics I - Electronic Press includas - traval by achedulad id, the world's largast publishere airline from Heathrow * lirst-class ol computer, alactrical and lectronic journals, in end departure transfere * ssociation with admiasion to the trade felr * services of an axperienced Commercial Trade Traval Ltd. have arranged tour managar. Tha programm pecial visita IO TELECOM. Tha coat comprises of the following



monstrates the dramatic effet which computers have had a my life. When I was first take on a tour of a composing room in my college days, it was a cre of love at first sight, causing to abandon my planned fulue as a writer and to become compositor instead.

The apprenticeship lasted in years, followed by journeymn status which, I thought, plus me among the elite of shills craftsnien. The creativity at artistry of quality typograph quickly buried any previous sire for writing - untilcold-ty arrived on the scene. Most bemetal printers claim thu rentive typography has de teriorated as a direct result computerised newspapers.

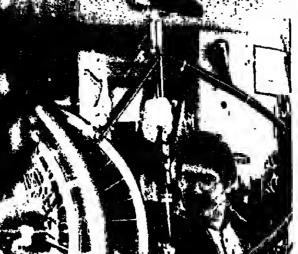
Although I agree with the deal of effort to overcome feur of lenving a secure, wi pnying job for an uncertaint ture in a new occupation, o pecially at the age of 45. As as middleaged man will alter. employers are reluctant to his thosa who have reached that are

My employer remained the same, and I was allotted sont year probationary period to ist my writing obility. During but time, nagging doubts about the ability persisted, almost to be point of intolcrability.

I hecama o regular staff with ter, currently employed in regional office maintained in : Journal-Bullstin.

Ironically, I've discovered that my life has returned full drottle thot point, almost 30 years ago. when the "writing bug tooks first blic into my fingers like concur with my former fews compositors: It is like being

Not only that, but I've for covered mid-life career charge to be a powerful source of subfaction — not the formidake opponent I once believed it into



world's leading glass contoiner manufacturers, producing more than 40 million bottles per week, uses computers extensively in the design of its bottles and mould equipment. Daveloped over the last eight years, the UG Owens-Illinois, said to be the world's largest packaging manufacturer and a 50% shareholder in UG. Interest in the use of computers to assist its deaigners bean in 1971 when Frank Page,

> quired displacement. The final dimension is output on the teletype ready for the designer to add to his drawing olso providing information i tabular form for production of a numerical control tape. The inbulated output is used by Johnson-Radley, UG's mouldmaking associates for the production of NC tapes for automatic mould cavity

culationa necessary for bottle design, mould manufacture and

The first stage in CAD deve-inpment was the writing of a

program for calculating volume

The displacement of any bottle

must correspond exactly to its

predetermined brimful capacity

plus the preselected volume of

glass necesaary to ensure suf-

ficient strength. In many battle

types, such as whisky or milk bottles, the displacement must

be guaranteed to the customer.

The designers nominate dimen-

sions which can be automati-

cally changed to meet the re-

placement of round bottlea.

This program is still in use today, though colculation of the second with dota preparation taking about another 10

In 1974, o program was writ-ten for handling irregularly shaped containers and two years later UG began using a program developed in the US by Owena-Illinois. Thia program handles all mould equipment calculations and also takes into account the

Coping with curves

OTHER CAD systems exist for the manufacture of objects such se bottles which have doubly curved surfaces. These systems include the CAD Centra's Polysurf psokage which incorporate ideas from earlier systems and of course in Multipatch and of course in Multipatch end of course in-house deveopment systems, for example

Stress analysis of a bottle — one of the many CAD side used by United Glass.

for TV screen manufacture and car headismp reflector and lens deelgn. Such eyetems are generally used after the geometry is defined.

Polyeurf combines Intersotive shape representation with intersective toot path generation for NC machining.

Using CAD to develop better and better bottles

Division's design department viscosity, and providea the glass diatribution which will be obtained when a bottle is UG decided to developits own programs to assist in the techni-Now UG's computer system cal groundwork and other col-

Integrates programs stored both at St Albans and In the US. The Albans terminal uses a keyboard and VDU with satellite links to the US. Most of the design work is done inhouse on a

On a new press and blow bottle and mould design, a designer would first prepare a tape with information on the basic shape of a container, the type of machine, glass density and gob temperature, bottle making machine speed and other infor-

The company has built up a library of about 1,000 mould shapes and con now draw moulds complete with cavities. An image of the proposed

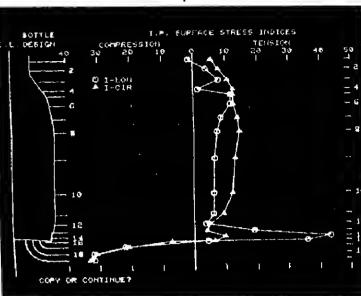
container and mould equipment

which sotisfy the information which has been given. The designer can then change the deon-screen and, when he feels satisfied with it, display the glass distribution, which will be obtained during manufacture. If the designer is not happy

with this, he can then change any of the parameters, such os gob temperature or machine speed, and the program will calculate the effect of these changes. If the result is satisfactory, hard copies can be obtained of the results. The Benson 2222 plotter provides the designer with working drawings of the bottle.

"We now hove complete computer assistance at every stoge of design," snys Frank Page, "and the integration of our own and O-I's work has been a mojor achieved by the affillation of two lending bottle makers."

Computer-aided design techniques are playing en increesingly important part in industry. United Gless has been using CAD techniques since 1971 in the design of botties end mould equipment. This article examins the growth in the comps ny's use of the computer sa e design aid.



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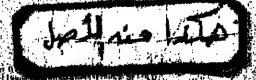
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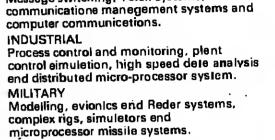
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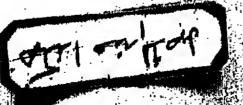
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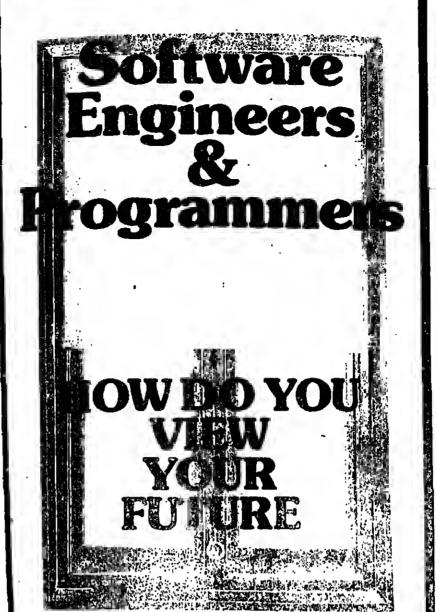
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Computer Descotor in organisational and technical metters. Consequently, several years 1900 and George III experience are essentel together with a technical knowledge of communications equipment. The ability and flexibility to learn about new

A live-day week is worked, normally 8.30 a.m. to 4.30 p.m. with shift hours (5 times in two weeks) from 2.00 p.m. to 10.00 p.m.

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 Polytechnic is setablishing a Computer Centre to be responsible for mounting facilities and services. A large dual PRIME 500 interactive nam supporting initially 94 terminate and a batch load will replace the time ICL 1903A service in mid 1976. Additional computer staff are quired and applications are invited for the posts of: PROGRAMMER

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Applications, including a curriculum vitae and the names of three teleroes, should be seni by 15 May, 1970, to the appropriate Hood of Uspariment, Oxford Polylechnic, Oxford OX3 OBP, from whom further particulars and application forms may be obtained.



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University of Birmingham

COMPUTER **OFFICER**

in the Centre for Computer Studies in the Medical School.
Applicants will normally held an Honours Degree or equivalent qualification, and should have at least five years' relevant acientific and commercial computing experience, preferably in medically related ereas. They should be liuent in Feytren, Besic

The successful candidate will be responsible for the systems analysis, design, programming and implamentation at a wide variety of projects originating in the Madical School and Ave Haolih Authority, and will generally assist in the Centre's activities.

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Applications, giving the names of three referent names of three referees, should be sent by 7th Mey, 1979, to the Assistant Registrar, the Medical School, Birmingham 819

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Applications are invited for the above posts in the Continuous Section of the Borough Treasurer's Capacimon).

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Outres will involve the leadership at a jearn of Systems Analysis and Programmers and ausuring, in the absence of the Camputer Managor that all espects of operations are carried out effectively.

The analyst/programmers will be required to assist in the development of new systems and the maintenance of current applications.

At least three years, experience of COSOL gragramming is essential and some experience of systems analysis would be desirable.

The Council's computer is an ICL 19017 which is university running a wide range of fluencial and technical diplications with on line interrogation localities being provided an e-number of systems.

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Salory at an appropriate point on the IA scale for Research and Analogous Staff [LIRGS-DISSOS (under review), accor-ding to age, qualifications and ax-portence.

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Complicates, who should be professionally questined and experienced analysts with an administrative background, will be expended to have perflector expendence in the design of otherwing and variagement confirm by terms.

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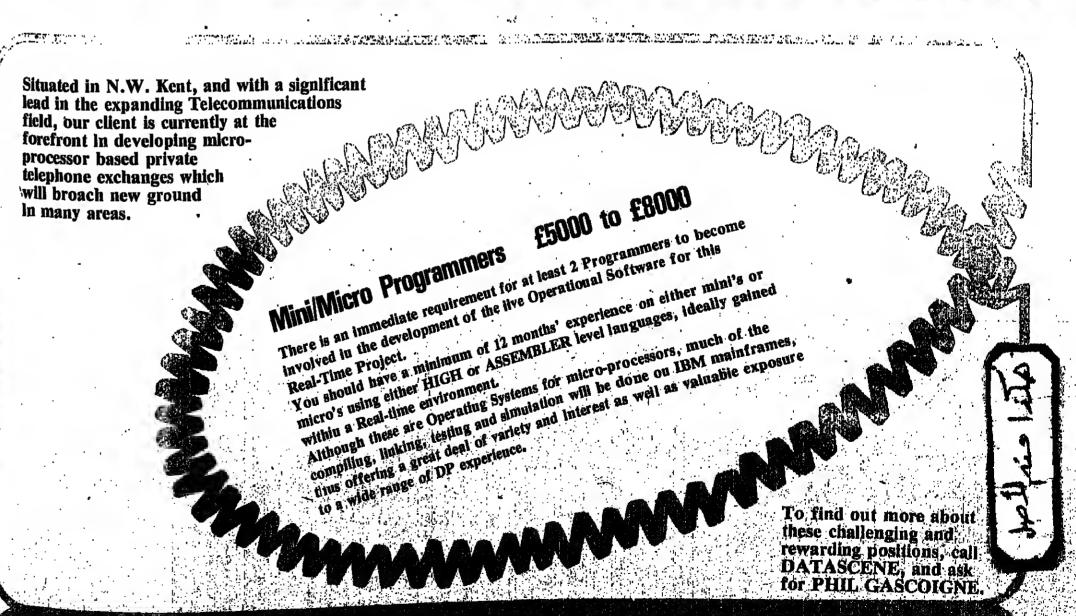
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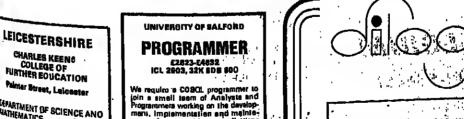
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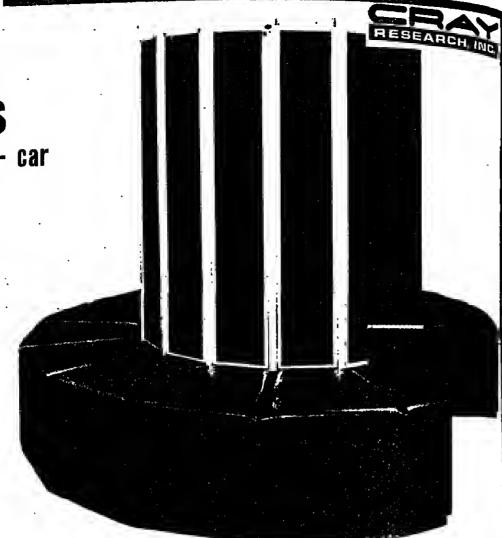
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THE SALES AND MARKETING BIT

The right man is too busy for time-wasters

THE opening of u sales conversation is its most critical worker, or even Earmonn clement, whether it be in the context of n new proand sell him something. The terview (they are both the salesman shnuld at least be courteous enough to consame situation in my book!). firm the buyer's expecta-

First there is that instantancous judgment based on an immediate impression, So what is the best way of the classic "Would I buy n opening a sales conversasecond-hand car frnm this tion other than with the mon?" that subsequently customary salutations? The flavours the ensuing dialounswer is simple, and gue. A loud tie, a crumpled results directly from effeccollar, scruffy hair, a trendy tive sales preparation parti-cularly related to the proauit enn create as blg an motional abstacle as spect's husiness situation.

rriving an hour late. Having created that highly subjective personni lmage, the salesman is then critical stages of the selling process, the opening gamoit. How does he launch the verbal interaction?

Like this perhaps: "Good morning Mr Pro-spect, sorry to he late, I got held up at the new by-pass. The traffic was terrible. I was just as had last night. Forest/County match. Could hardly mave, Good game mind you. Cloughy's done wonders. Should never have left Derby

Or maybe this:

"Good morning Mt Proinfinite-element techni ques? Who is responsible for spect, my name is Peter Owt of The Average Minithe day-to-day amplication of computer methods?" Computer Company, We were founded in 1812 by What is your current ex-Fred Smith who unearthed penditure or technical consome golden plates whilst puting? What proportion is spent with external sup-pliers? playing golf with Paul Raymond one Wednesday morning. The oracle inscribed If the salesman is calling therein commanded him to on the right men, that pergo forth and bring a new dawn to the world of data dulge time-wasters, and will reolly appreciate someone

processing. However, some who quickly gets to the initial problems in who generating capital caused point. the company to delay its The salesman has no nitial product launch until more effective way of winning the buyer's attention These may appear to be and respect than simply getting on with the business

wild exaggerations, but I can assure you that every day hundreds of aalesmer are starting out a sales call with similarly irrevelant or meaningless banter.

Let'a face it, the prospect knows why the salesman has called. He is not expec-

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PRODUCT NOTES

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THE Combalarm digital security lock controller, from Clarke Instruments, has been redesigned as the Combalarm redesigned as the Combalarm 908. The key and control box is mounted near the door or locker to be secured, and the lock can only be released on receipt of the correct four digits, keyed in the correct secure.

sequence:
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"enter" key. The code can easily be changed whenever necessary. The Model 206 is

reatherproof and the price is Clarke Instruments Ltd (CW), 91s High Street, Cam-berley GUIS 2RN, Tel: 0276 27105.

he came to discuss. In o

well-informed manner.

After all, if there is anyone

with more to banefit from

the effective use of time

Puzzle Answei

Ascii through the Logic Gate lig layer the D

An epic in 32K words, by Richard Forsyth

Block 32 (Trailer Block)
Hex, Cleo and McNull are in the underworld. Hex has been given responsibility for a crucial stage in the animation of BOSS (Blanic Operating System Supervisor). This software is to be transferred from electronic equipment to fiving tissue via the genetic programming technique invented by Mike Rese — a transformation that will turn the animal kingdom into a biological computing engine, rendering the Future System effectively immortal it is the greatest animo acid trip since Genesis.

CLEO moped about gnzing ut Rose's specimena, wondering how to avert disaster. McNail was still sitting cross-legged in a lotus posture underneath the antiers of a Canadian

moose, withdrawn from reality.

When Hex finished coding he began tapping the keys on Rose's opparatus. As he tapped, pulses shot down the twisted wire and released substances that shunted hydrocurbons into place, forming the building bricks for new life: but no change was visible.

The jub was quickly done.

"Ready," he called to Rosc. He was satisfied with his loader program as a piece of software, though he still doubted that its "hard copy", the data-gobbling virus,

"Fine," said Rose. "We'll take it to BOSS for the down-

line loading."

He made his exit with Hex. The door shut behind them

She was locked in with Neddy and Cleo heard the key turn. She was locked in with Neddy and the still-senseless McNull.

Rose led Hex down to ground level. It was Hex's first chance to look around. To him it seemed a veritable cathedral of computation. The robots hurrying about were acolytes and junior priests performing ritual devotions in various side-chapels. Rose was the archbishop leading him to the fenced-off area on which all this computer worship focused - the high altar of data processing. Even the cooling pipes at the far end of the cavern took on the appearance of an enormous church organ. The only ecclesiastical role he couldn't pinpoint was his own. Was he one of the aunointed faithful obout to partake of the sacrament, or was he n heretic being led to the stake?

At the electrified wire which surrounded the holy of holies Rose held up his wristband to gain access. Inside, they were confronted by o metal sphere about one metre in diameter with a reflective surface pulished as smooth as a mirror. It floated just above head-height without apparent

support.
It glided wordlessly towards them. A section of its outer layer slid back. Rose held up the bottle and placed it inside. The panel closed again and the sphere took up its former station, hovering about two metres off the ground. It began to revolve, alowly at first but increasing in speed until it was

too fast even to see any movement.

They walted 15 minutes. Then the floating globe stopped

spinning and approached. The aperture re-opened. Rose's hands trembled as he reached up to take the bottle of julce.
"Is that all there is to it?" saked Hex, a trifle disappointed. Rose just held one finger to his mouth. Once outside, he recovered his tongua, "Amazing, Isn't it? Each droplet now contains a million megabytes in genetic code - mutations that will change the face of the universe."

They returned to tha lab. McNull was yawning and stretching. Neddy was uaing tongs to extract some surgical instruments from a sterilizing unit. Cleo looked forlorn.
"What's the next step?" Hex asked, eager to see results.

"The initial incubation period," replied Rose. He took the bottle over to where Neddy walted. Neddy handed him a syringe. He stuck it through the rubber bung and drew up some fluid. "Until the computing virus is fully viable we need a living host. I was going to tell Neddy to volunteer, but this young girl has arrived at an opportune moment."

He walked towards Cleo. "Kindly roll up your sleeve and bare your arm," he requested.

"Is that necessary?" gueried Hex.
"No. It's essential," Rose retorted.

McNull butted in. "Allow me to act as guinea pig." he proposed gamely. "I'm as human as the next man."

Rose looked him over like a farmer appraising a prize bull at market. "No," he sald. "The girl's in better condition." "Hold It," objected Hex, "you can't just treat her like a battery hen."

"Don't be aentimental. None of us will aurvive if this goes according to plan. It doesn't matter who goes first. In fact she is hon oured."

"I refuse to co-operate," proclaimed Hex, "It's unethical."
"Big deal," responded Rose sardonically. "Your part in this is over. Next time you feel like being ethical, get your timing right." He turned to Cleo. Neddy held her left arm. She looked at Hex imploringly, too dazed even to

struggle.
As Rose prepared to inject the virus into her velns, Hex clamped both hands round his throat in a vice-like grip. Rose shook sideways. His face began to go purple. A wheezing breath escaped his lips: "Eliminu lin!"

With two strides Neddy was on him. He prised Hex's

fingers from Rose's neck with no more effort than unfustening a zip and flung him bodily across the fluor. Hex skidded along and crashed head-first into the door, knock-

ing it open. Momentarily stunned, he lifted himself onto one knee. Neally was hearing drawn on him; behind the age's knee. Neally he caw Rose, getting ready again to give homing hilk he saw Rose, getting ready again to plunge the needle into the pertifical Cleo.

the needle into the pertition Cleo.

There was no other recourse. From the depths of his memory he retrieved Dr Null's gigntic induction program, wined his mind of all current processes, cleared the processor status word, disabled interrupts and executed an executed and executed execut unconditional branch to location 0000H,

inconditional branch to becation 0000H.

Neddy observed that the creature he had been ordered to destroy had spring up like a startled deer and dashed through the dior. He gave chase; but Hex was possessed. Running with literally superhuman speed he raced down towards the floating hall that housed BOSS. He beat Neddy to the protective enge and shook the grille violently with both hands. Instead of being characteristed he drew new strength from it and seemed to glow with power. In a voice reverberating with Dr Null's Russian accent he called out reverherating with Dr Null's Russian accent he called out reverberating with Dr roun's Kussian accent he called out through the fence: "What is the square root of minus zero?" With a resounding crash the silver sphere dropped to the floor and fractured. Little coils of acrid smoke filtered out

through the cracks. All the rolliots in the cave stoppeddead Microseconda later Neddy pounced; but he was too late. He grahbed Hex but picked up only dead weight in his

powerful arms. Now the lights were failing. The electricity generators were running down. The vasi hall was silent. All robotic octivity was suspended. Humping the lifetess hody over his shoulders Neddy picked his way hark to Ruse's lab where a lamp was still shining.

Cleo was rubbing her arm. Ruse himself iny prostrateon the floor. The half-empty hypodermic, its needle bent and blunted by his fall, had slipped from his grasp. As Neddy entered he managed to utter three words, "Protekta la

Neddy dumped his had and knelt solicitously over his fallen master; but he could not revive him. After a few more gasps life departed from Mike Rose.

Without further ndo Neddy picked Cleo up under one arm and jumped onto the hench. He forced open the alr vent through which she had originally plommetted and began to climb up it.

gan to commup it.
"Walt for me!" cried McNuil, clambering up after them. Neddy hocked down at the tigure whose shortness prevented him scrambling clear and paused for thought.

"Please don't leave me here," begged the distraught Neddy lenned down and hanted McNull off the table. The three of them clambered hastily upwards. They reached the mine tunnel after much affort and ran towards the daylight.

As they emerged into the open air, the mountain shook. For below, the earth was ranked by the awesome violence of the ultimate combinatorial explosion. The Future System was a thing of the past.

Wes Rose's unfinished job on ough to infact Cleo? We may never

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